



NPS National Transit Inventory and Performance Report, 2016



This is a summary of the 5th annual National Park Service Transit Inventory and Performance Report. This effort:

1. Identifies NPS transit systems across the country,
2. Tracks the operational performance (e.g. boardings) of each system, and
3. Inventories NPS and non-NPS owned transit vehicles and collects detailed vehicle information.

43.6 Million
Passenger Boardings

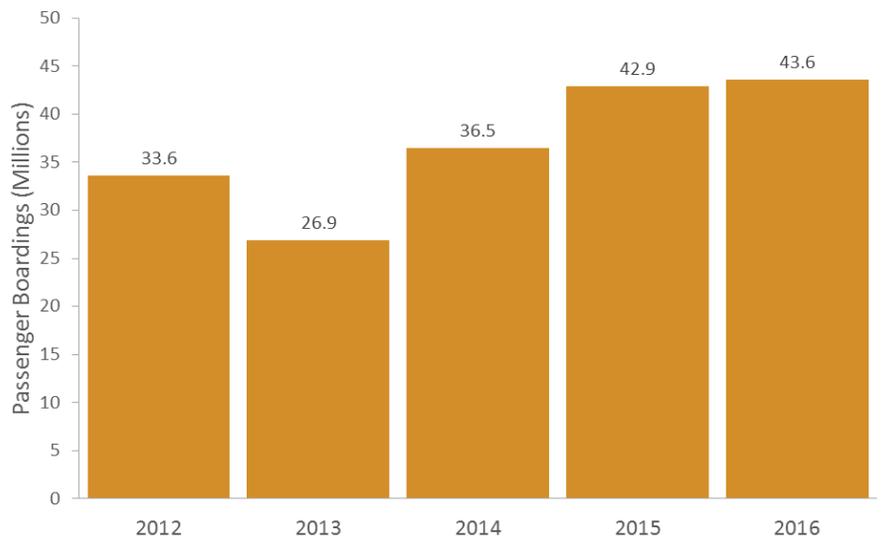
64 Parks
Represented

100 Transit
Systems*

843 Vehicles

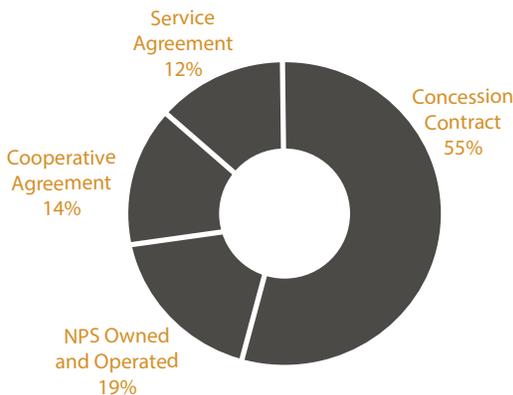
*In 2016, 28 transit systems were removed from the inventory that did not meet the definition of transit.

Annual NPS Transit System Passenger Boardings

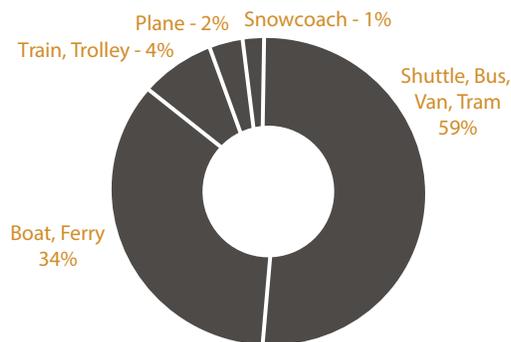


- In 2016, 100 transit systems operated in 64 of the 417 National Park Service units. Of the 100 systems, NPS owned and operated 19 systems.
- The top ten transit systems accounted for 84% of the 43.6 million passenger boardings in 2016. The largest transit systems are at Ellis Island/Statue of Liberty National Monuments, Grand Canyon National Park, Zion National Park, and Yosemite National Park.
- Approximately 30% of the NPS transit systems operate year-round.
- The majority (81%) of transit systems operate a fleet of 1 to 10 vehicles. Only one system has a fleet of greater than 40 vehicles (Denali National Park).

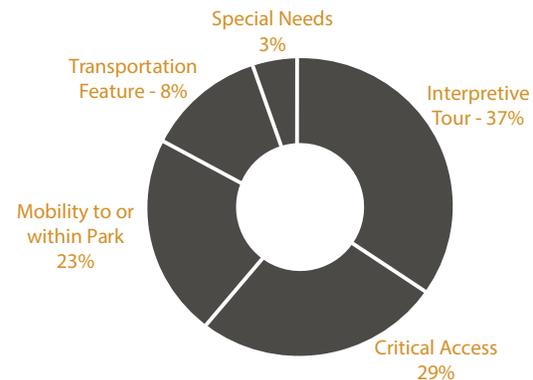
Business Model
 (by # of transit systems)



Mode
 (by # of transit systems)



Purpose
 (by # of transit systems)

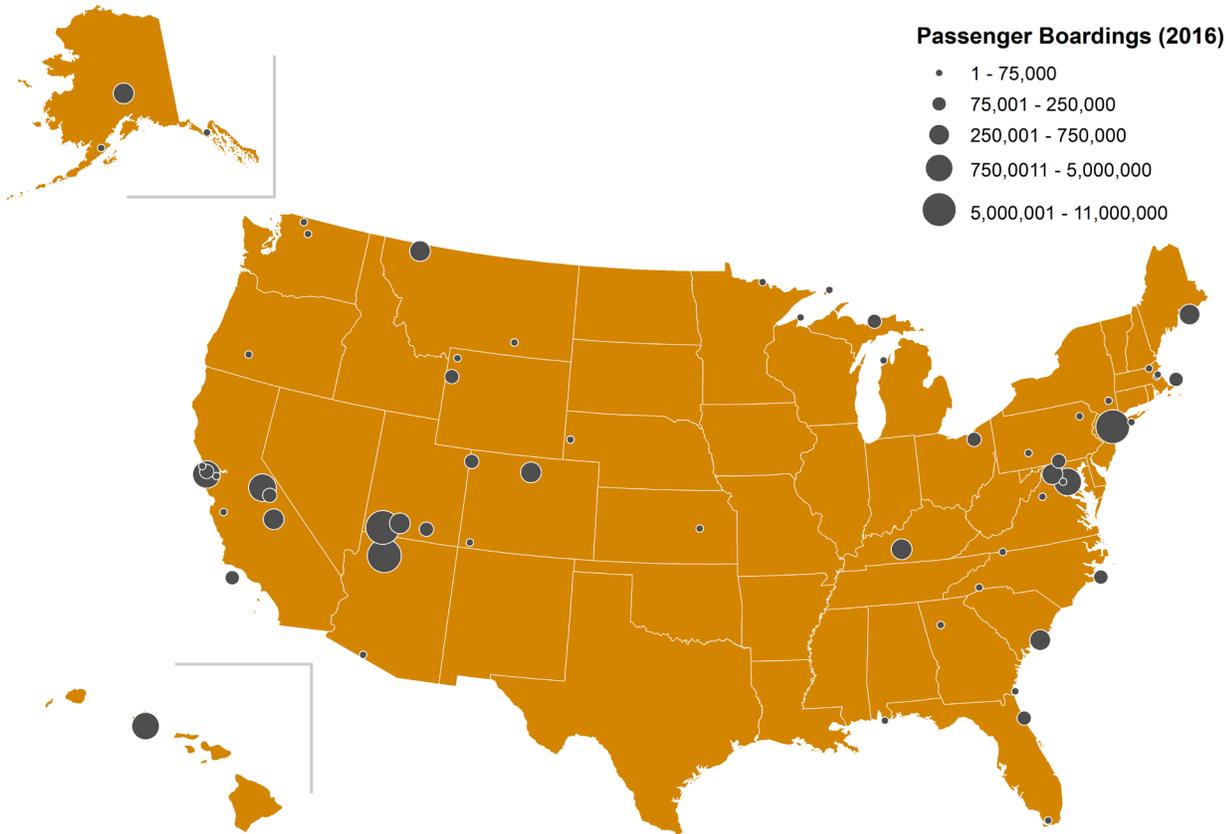




NPS leverages the private sector to provide the majority of transit services. 81% of NPS transit systems are operated by a non-NPS entity under an agreement or contract. These systems account for almost 99% of passenger boardings service-wide. The remaining 19% of transit systems are owned and operated by NPS and account for the remaining 1% of boardings.

NPS continues partnerships with local transit agencies. 13 systems are operated by a local transit agency under a specific agreement with NPS. NPS shares the operations and maintenance costs of several of these systems.

NPS uses individual park websites to communicate essential traveler information. 85% of parks in the inventory provide transit information on their websites, and 43% of parks provide accessibility information.



Performance Measures

The majority of the NPS-owned transit system vehicles are accessible for people with mobility impairments. A total of 68% NPS-owned vehicles are accessible to people with mobility impairments (e.g. require wheelchair lift), while 32% are not accessible.

A higher percentage of NPS-owned transit vehicles operate on alternative fuel compared to non-NPS transit vehicles. 60% of NPS-owned vehicles operate on alternative fuel, while 20% of non-NPS-owned vehicles operate on alternative fuel.

NPS transit systems mitigate vehicle emissions. The net CO₂ emissions savings of the 48 systems evaluated was equivalent to removing 8,423 light duty vehicles from operation for an entire year.

NPS faces over \$40 million in transit vehicle recapitalization needs in the next ten years. NPS-owned shuttle/bus/van/tram vehicles have an estimated \$2 million in overdue recapitalization costs and \$43.8 million in recapitalization needs between 2017 and 2027. Parks with estimated transit vehicle replacement costs over \$1 million during the next ten years are: Glacier National Park, Grand Canyon National Park, Harpers Ferry National Historical Park, Yellowstone National Park, Yosemite National Park, and Zion National Park.



Transit Inventory System Case Studies

The 2016 NPS Transit Inventory and Performance Report includes profiles of 10 transit systems. The following case studies highlight a variety of shuttle, ferry, and rail systems that enhance the visitor experience, and help the NPS achieve their environmental, financial management, and safety goals. The profiles highlight how the NPS leverages partnerships with external agencies through concessions and service contracts, and cooperative agreements to provide a great visitor experience while making the best use of limited resources. These transit systems take private vehicles off park roads, which reduces impacts to resources, while also allowing more visitors to enjoy NPS sites. The map below shows the locations of the 10 transit systems highlighted in the case studies.





Acadia National Park

System	Island Explorer and Bicycle Express
Agreement Type	Cooperative Agreement
Established	1999
2016 Boardings	~575,000
Average Trips per Day	122
2016 Fleet	28 medium-duty shuttles and 4 vans

The Island Explorer started operation in 1999 under a cooperative agreement between the NPS and Downeast Transportation, Inc., a nonprofit transit service organization. Acadia National Park expanded the service in 2005 to include the Bicycle Express. The Island Explorer service provides car-free connections for both the local communities and park visitors by linking hotels, Inns, campgrounds, hiking trails, non-motorized carriage roads, state and international ferry terminals, shopping and dining, and the regional airport, resulting in reduced congestion and demand for parking. This fare-free service is funded by a variety of partners, including the National Park Service, Federal Transit Administration, Federal Highway Administration, State of Maine Department of Transportation, municipalities, businesses, and donations from riders, Friends of Acadia, and L.L. Bean. All of the vehicles are owned by the State of Maine with Downeast Transportation performing all service operations and maintenance activities.

“This propane-powered bus system has transformed how visitors enjoy Acadia National Park and connect to the surrounding gateway communities. The Island Explorer is an outstanding example of how a partnership among public and private entities can improve the visitor experience and protect park resources while serving the neighboring towns.”

Key Attributes

- Safety & Multimodal Connectivity:**
 Connections to the regional airport and state and international ferry terminals support car-free travel to the park. Bike racks on Island Explorer buses or the designated Bicycle Express van service allow bicyclists to enjoy the park without traveling along main roads or needing to coordinate transportation. Improved safety is a direct result of reducing overflow and road shoulder parking.
- Visitor Experience:**
 Visitors can access park and regional attractions without a car, reducing congestion, travel time, and the stress of finding parking. Riding the Island Explorer provides access to an array of recreational opportunities, and with many pick-up/drop-off locations it allows for a customizable park experience.
- Environmental Impact:**
 The propane-powered buses reduce the number of vehicle trips taken, mitigating congestion and emissions of smog-causing pollutants and greenhouse gases. Fewer vehicles parking in unauthorized areas also reduces damage to roadside vegetation and subsequent soil erosion.





Cape Cod National Seashore

System	Coast Guard Beach Shuttle
Agreement Type	NPS Owned and Operated
Established	1985
2016 Boardings	~94,000
Average Trips per Day	32
2016 Fleet	10 shuttles

Consistently rated as one of the top 10 beaches in the nation and as one of the world's most visited protected natural areas, Cape Cod National Seashore must balance the impact of visitors on both the Seashore and the local community. The NPS owned and operated shuttle at Coast Guard Beach is key to achieving this balance and ensuring visitor access. After the majority of the beach's parking and amenities were destroyed in the Blizzard of 1978, the NPS moved the parking further away from the coast and implemented a shuttle to carry visitors 1.8 miles to the popular beach. This service has allowed increased visitation at the beach, reduced congestion, and ensured continued access for locals. The shuttle service proves to be a model that achieves a balance between resource protection of the fragile coastline and providing visitor access and enjoyment.

“Most of the visitation to Coast Guard Beach occurs over just a two-month period during the summer season, and the level of visitation accommodated would not be possible without the shuttle service.”

Key Attributes

- Safety & Multimodal Connectivity:**
 Shuttle stops are separated from the parking lot traffic to minimize pedestrian/vehicle interactions and increase safety. Trained drivers also play a key role in ensuring safety for visitors as they shuttle them to and from the beach. Paired with Cape Cod's Flex Bus, visitors can take transit from most parts of the Cape and connect with the shuttle to make their way to the Seashore. Visitors can also access the extensive trail network in and around the National Seashore.
- Visitor Experience:**
 The use of the shuttle service paired with offsite parking increases access to the Seashore. Shuttles are equipped with racks to carry surfboards, coolers, and more to ensure visitors can bring their beach provisions. The shuttle eliminates the stress associated with beach parking.
- Environmental Impact:**
 By removing vehicles from Cape Cod's already congested roadways, the service helps to reduce emissions. The shuttle service also allows the NPS to locate parking areas and other amenities further away from the beach to minimize their impact to environmentally sensitive areas and mitigate potential damage from storms.





Cuyahoga Valley National Park

System	Cuyahoga Valley Scenic Railroad (CVSR)
Agreement Type	Cooperative Agreement
Established	1989
2016 Boardings	~214,000
Average Trips per Day	2 trips: Tues. - Thurs. 3 trips: Fri. - Sun.
2016 Fleet	32 total cars

The Cuyahoga Valley Scenic Railroad (CVSR), running parallel to the Cuyahoga River and Ohio & Erie Canal Towpath Trail, is one of the main features of Cuyahoga Valley National Park (CUVA). Historic trains allow visitors to see the park by rail and reach key park destinations without a car. CUVA established a cooperative agreement with the non-profit CVSR in 1989 to provide excursion rail service throughout the park. CUVA owns and maintains 26 miles of railroad tracks while CVSR owns the historic train equipment and provides the service. Both the park and CVSR benefit from the collaborative nature of their partnership; the CVSR does much more than operate the train service, it coordinates field trips, educational events, and outreach to new audiences.

“CVSR’s Bike Aboard! program provides visitors with a fun, easy, way to experience Cuyahoga Valley National Park through both a bike ride and a train ride. Visitors can ride their bike one way on the Ohio & Erie Canal Towpath Trail and then return to their vehicle via train. Visitors can determine exactly how far they want to ride their bikes (as short as 2 miles and as long as 20 miles)...all for the low price of \$3.00.”

Key Attributes

- Multimodal Connectivity:**
 CVSR provides visitors with a multimodal park experience. Train stations outside of the park are served by regular bus routes. Train cars are equipped with bike racks through the Bike Aboard! program, allowing visitors to experience the park via train and then explore the park and bike back to their car. Similarly, the Hike Aboard! program allows visitors to use the service and reach trails and other cultural attractions, without using their vehicle.
- Visitor Experience:**
 CVSR provides visitors with a unique park experience. The service uses historic railroad equipment from the 1940s and 1950s, which provides a memorable way to learn about the history of rail transportation in the area. The train offers an excellent view of the natural scenery and wildlife of the park and exclusive accessibility to certain areas. There are three main boarding stations and an additional five bike stops along the train route, allowing visitors to enjoy a variety of park locations.





Denali National Park and Preserve

System	Bus Tours, Transit/Shuttle, and Courtesy Bus Service
Agreement Type	Concession Contract
Established	1972
2016 Boardings	~371,000
Average Trips per Day	~109
2016 Fleet	86 diesel and 15 propane school buses

In 1972, Denali National Park began limiting private vehicle access to its 92-mile out and back Denali Park Road to protect the resource and provide a high quality visitor experience. While tour buses have operated in the park since the 1920s, the park introduced shuttle buses in 1972 in response to increasing visitation after completion of the George Parks Highway between Anchorage and Fairbanks. Denali National Park's current contracting model, which requires the concessioner to own the buses and replace them on a 12 year cycle, has been in place since 1978. Under the current contract, which the park executed in July 2016, the concessioner employs over 150 drivers and mechanics to operate a fleet of approximately 100 buses over a four month summer season. A direct benefit to the park is the generation of a concession franchise fee which may be used to support a variety of park functions. Visitors benefit as they are able to experience the park through the different transportation services that are offered.

“Denali’s bus system provides for an inspiring wilderness excursion while reducing traffic congestion, delivering a high quality visitor experience, and most importantly, protecting Denali National Park and Preserve for generations to come.”

Key Attributes

- Visitor Experience:**
 The concessioner provides visitors with a variety of transportation system options over the entirety of the 92-mile Denali Park Road: a narrated tour service given by a trained naturalist guide, a transit/shuttle service which allows visitors to disembark and re-board anywhere along the Park Road, and a camper bus service for hikers and campers to access the backcountry. In addition, courtesy transportation is provided for free on the first 15 miles of the Denali Park Road. Using the free shuttle system, visitors are able to go see sled dog demonstrations, one of the many unique features of the park.
- Environmental Impact:**
 The Denali National Park’s Vehicle Management Plan allows for a total of 160 vehicles to access the restricted section of the Denali Park Road per day. Per the contract, the concessioner has the right to operate up to 91 buses in a single day. More recently, in 2015 a new aspect of the concessions agreement introduced propane fuel buses to the fleet, which reduced greenhouse gas emissions.





Ellis Island/Statue of Liberty

System	Statue of Liberty Ferries
Agreement Type	Concession Contract
Established	1935; 2008 (current contract)
2016 Boardings	~11 million
Average Trips per Day	60 trips (30 from each NJ and NY launch sites)
2016 Fleet	7 Ferries

The Statue of Liberty Ferries started operation in 1935 and provides primary access to Ellis Island and the Statue of Liberty. Through the current concessions contract, the park receives ferry service from both the New York and New Jersey sides of the harbor as well as shuttle services for passengers between the islands. With over 4 million visitors each year, this business arrangement allows the park to focus on providing a great visitor experience at the park. Statue Cruises handles the ferry logistics as well as interfacing with the local authorities to secure slip space and access for visitors arriving at the “front door” of the park. In addition to connecting historic sites, the ferry ride provides one of the most sought after views of the New York City skyline.

“Statue Ferries provide millions of visitors with primary access to Ellis Island and the Statue of Liberty each year. On the ride over, visitors trace the historic paths of immigrants as they first arrived to United States amongst the backdrop of the awe-inspiring New York City skyline.”

Key Attributes

- Safety & Multimodal Connectivity:**
 Leaving from docks in Battery Park, NY and Liberty State Park, NJ, the ferry service is accessible from city and regional public transit systems. With almost 11 million boardings a year, ensuring each of these passengers is safely transported is a top priority of the service.
- Visitor Experience:**
 In addition to providing primary access to the park, the ferry experience offers some of the best views of the Statue of Liberty and New York City skyline. Interpretive videos on the ferries provide an opportunity to understand the journey of the immigrants that first came to Ellis Island.
- Environmental Impact:**
 Ferries provide a low impact way of getting millions of visitors to the park every year. As the park prepares to rebid the contract, environmental friendliness of the vessels will play a key role in evaluating proposals.
- Financial & Asset Management:**
 The contract between the NPS and ferry concessionaire allows the park to focus on its core competencies while entrusting a quality industry operator to run and maintain the ferry service.





Fort Matanzas National Monument

System	Fort Matanzas Ferry Service
Agreement Type	NPS Owned and Operated
Established	1937; NPS Owned and Operated since 1976
2016 Boardings	~127,000
Average Trips per Day	8
2016 Fleet	2 Ferries

A ferry service is the only way for visitors to access Fort Matanzas, an important historic site that was critical during the colonial wars. Private ferry services started operating at the Fort in 1937, and the NPS took over the role as owner and operator in 1976. Through a transportation fee paid in every admission to nearby Castillo de San Marcos, the park is able to pay for ongoing transit operations and maintenance costs. In addition to visiting the Fort, the quarter-mile journey also provides visitors a chance to see and learn about the wildlife and ecosystem that make the area unique. The flexibility of the NPS owned and operated model allows the park to offer new services to the public, including a night time “torch light” tour. NPS is exploring a possible expansion of service to include dedicated nature tours along the waterway.

“The Fort Matanzas ferry provides primary access to a landmark from the early days of the colonial wars. In the trip over, visitors are given a chance to see the wildlife that also makes these waterways an ecological treasure.”

Key Attributes

- Safety:**
 Due to frequent thunderstorms, park rangers regularly check radar and monitor conditions to ensure a safe trip to and from the Fort. Vessels are also regularly maintained to stand up to the rigors of the saltwater environment.
- Visitor Experience:**
 Ferries provide primary access to Fort Matanzas while journeying along a critical coastal habitat. Interpretive services on the ferry ride provide details on the Fort’s history and local wildlife. For many visitors, the ferry trip is a unique chance to get on the water and see dolphins, sea turtles, and other wildlife found in the estuary.
- Environmental Impact:**
 As the only way to access Fort Matanzas, the ferry service allows the park to limit impacts to the island and maintain an excellent visitor experience. Park rangers take the opportunity to educate the public about the importance of clean waterways and ecosystem preservation while they are travelling through this habitat.





National Mall and Memorial Parks

System	D.C. Circulator
Agreement Type	Cooperative Agreement
Established	2015
2016 Boardings	~494,000
Average Trips per Day	73 trips (10 minute headways)
2016 Fleet	13 heavy-duty buses

The D.C. Circulator began operating its National Mall Route in 2015 under a cooperative agreement between NPS and the District Department of Transportation (DDOT). Cooperative agreements are used for partnerships between NPS and a local government agency or non-profit. The National Mall is serviced by other tour companies, but the agreement with DDOT is unique in that it allows visitors and residents to use an affordable, District-run transportation service to visit the monuments and museums on the National Mall, and is fully integrated into the larger local and regional transit network. Additionally, the D.C. Circulator National Mall route was inspired by the 2010 National Mall Transportation Plan, which advocated for coordinating with DDOT on providing transit to park sites in D.C. Both the NPS and DDOT share the monthly operating costs while DDOT staffs, operates, and maintains the fleet. The entire D.C. Circulator service is also supported by Washington Metropolitan Area Transit Authority and D.C. Surface Transit Inc. (non-profit organization that includes business improvement districts).

“The D.C. Circulator connects to the local and regional transit network and provides frequent transportation service to National Mall sites that were previously difficult to reach.”

Key Attributes

- Multimodal Connectivity:**
 The buses are equipped with bicycle racks, which allow visitors to bring their bicycle on board the buses. The Circulator also connects to the Capital Bikeshare system, with stations located at the Lincoln Memorial and the Jefferson Memorial, which are two of the most visited destinations in the park.
- Visitor Experience/Access/Affordability:**
 The National Mall Circulator route consists of 15 stops and links to Union Station. This connection encourages District residents and visitors to explore the park. The Circulator fare can be paid using a Washington Metro SmarTrip card, which entitles passengers to free on-and-off service for two hours at a time.
- Environmental Impact/Financial Viability:**
 The National Mall uses revenue from newly-installed parking meters on park roads to supply their share of monthly D.C. Circulator operating costs. Through this mechanism, the National Mall uses parking revenue to directly promote alternative transportation in the park.





Rocky Mountain National Park

System	Bear Lake/Moraine Park Shuttles; Hiker Shuttle to Estes Park
Agreement Type	Service Contract
Established	1970s
2016 Boardings	~706,000
Average Trips per Day	~114
2016 Fleet	2 gasoline; 2 hybrid electric; 8 diesel shuttles

Rocky Mountain National Park first established a shuttle system in the mid-1970s. The modern era of their transit service began in 2001, when the park instituted two formal shuttle routes between a Park & Ride transportation hub and popular sites along the Bear Lake corridor. Known as Bear Lake and Moraine Park Routes, these services provide access to a multitude of trailheads and campgrounds. Additionally, there is a Hiker Shuttle, (started in 2006) which is an express route between the gateway community Estes Park and the Park & Ride hub. The transit services are delivered through a service contract with Rocky Mountain Transit. Operations for the service are funded entirely by revenue from the transportation fee that is included in the park entry fee. The service contract, first initiated in 2001 and renewed every 10 years, stipulates that the park pays the contractor based on the number of service hours provided, and the contractor pays directly for all costs to operate the shuttle system, such as buses, drivers, and maintenance costs. The park is responsible for maintaining the shuttle stops and Park & Ride hub.

“The shuttle service provides a level of access to Bear Lake that would not be possible by personal vehicle. The shuttle service also creates hundreds of new loop-hiking opportunities by making it possible for visitors to through-hike various trails.”

Key Attributes

- Safety/Visitor Experience:**
 Vehicle restrictions on park roads are implemented when parking lots fill, which is increasingly frequent with growing visitation. Therefore, on the most crowded days the shuttle system becomes the only way to access popular sites in the park. This eliminates the road safety hazard and congestion that roadside parked cars impose on visitors.
- Financial/Asset Management:**
 The “turn-key” service contract benefits Rocky Mountain National Park because the park does not have to set aside base funds for purchasing vehicles, or for the operation and maintenance of the system. Instead, the service is funded through a portion of the entrance fee.
- Environmental Impact:**
 The most recent service contract called for a “greening” of the shuttle fleet, so the contractor installed diesel particulate filters to the existing diesel buses and added two hybrid electric buses to the fleet. These upgrades reduce vehicle emissions, increase the overall fleet fuel efficiency, and reduce noise pollution.





Yosemite National Park

System	Yosemite Valley Shuttle
Agreement Type	Concession Contract
Established	1970
2016 Boardings	3.7 million
Average Trips per Day	270
2016 Fleet	18 hybrid electric-diesel buses

The Yosemite Valley Shuttle is a free, year-round shuttle that provides access to the eastern Yosemite Valley and all of its overnight accommodations, stores, parking areas, and trailheads. Yosemite National Park has a long history of using commercial tours and shuttles to provide car-free access to park attractions, and first began providing public transit services in the 1960s. In the 1970s, the park closed some roadways and increased transit service to continue meeting visitor transportation demand. The park owns all the shuttles for this service and the vehicles are operated and maintained through a concessions contract.

“Yosemite National Park and its transit partners offer a variety of services that provide access to and around the park, affording visitors the option to leave their cars at home.”

Key Attributes

- Multimodal Connectivity:**
 The Yosemite Valley Shuttle provides connectivity between the campground, lodges, and trailheads throughout the Valley. This shuttle route connects to regional transit provided by the Yosemite Area Regional Transportation System (YARTS), allowing visitors to travel to and around the park without a personal vehicle. The Yosemite Valley Shuttle is the only form of transportation available to access certain popular trailheads and hikes in the park, such as the Mist Trail to Vernal Falls, the John Muir Trail, Happy Isles Nature Center, and Mirror Lake.
- Visitor Experience:**
 Traffic congestion is an ongoing challenge for the park; Yosemite has implemented a bus-only lane through much of the park to keep its shuttles on schedule. The park is also in the process of constructing bus turnouts that include concrete braking pads and accessible platforms.
- Environmental Impact:**
 Yosemite National Park invested in diesel-electric hybrid buses to reduce the environmental impact of the shuttle service. These buses reduce impacts to air quality in the park and are quieter than older diesel buses.





Zion National Park

System	Zion Canyon Shuttle
Agreement Type	Service Contract
Established	2000
2016 Boardings	6 million
Average Trips per Day	170
2016 Fleet	39 buses; 23 trailers

The Zion Canyon and Springdale Shuttles, established in 2000, provide seasonal shuttle service for car-free access to the sights and attractions located in Zion Canyon and the town of Springdale. During peak season, Zion Canyon Scenic Drive is closed to private vehicles and is only accessible by shuttle bus. In recent years, visitation at the park increased significantly, and buses now run every four minutes during peak season. Frequent service allows visitors to board the buses at their convenience. The system is now running at its capacity, and park staff are considering how to best manage the system in the future. The shuttle operates under a service contract; Zion National Park owns the vehicles and maintenance facility, and the contractor operates the system and maintains the vehicles. The fleet has exceeded its useful life and park staff are exploring options for fleet replacement.

“Today’s visitors expect the shuttle to be part of the park experience – they love the convenience and ease of someone else doing the driving.”

Key Attributes

- Connectivity & Visitor Experience:**
 The Zion Canyon and Springdale Shuttles operate on two connected routes; one through Zion Canyon, and the other through the gateway town of Springdale. With nine stops along each route, visitors can leave their vehicle at their hotel and visit shops and restaurants in the town and board and disembark at their leisure. Without cars in the canyon, the visitor experience is less stressful and quieter.

Environmental Impact:
 The Zion Canyon Shuttle system operates propane-powered shuttles that replaces nearly 5,000 private vehicles daily. The system serves as a tool to provide visitor access in the canyon and protects the park’s resources, including improving air quality, reducing impacts to roadside vegetation and wildlife habitat, and reducing noise.

- Financial & Asset Management:**
 Although there is no charge to ride the shuttles, a portion of the park entrance fee contributes to all the necessary components of operating and maintaining a complex transportation system.



Table of Contents

List of Figures	iii
List of Tables.....	iii
Acronyms	iv
Introduction	6
<i>Updates in the 2016 Inventory</i>	6
<i>Data Collection and Methodology</i>	7
Inventory Results.....	8
<i>Inventory Base-Data</i>	8
<i>System Characteristics.....</i>	9
<i>Passenger Boardings</i>	12
<i>Vehicles.....</i>	20
Performance Measures.....	24
<i>Visitor Experience</i>	24
<i>Operations</i>	25
<i>Environmental Impact</i>	28
<i>Asset Management.....</i>	31
Next Steps.....	34
Appendix.....	35
<i>Appendix A – Acknowledgments.....</i>	35
<i>Appendix B – NPS Alternative Transportation Program (ATP) Goals and Objectives</i>	38
<i>Appendix C – Definition of Transit.....</i>	40
<i>Appendix D – 2016 NPS National Inventory System List.....</i>	43
<i>Appendix E – Systems Removed from 2016 Inventory</i>	49
<i>Appendix F – Estimated CO₂ Emissions Methodology</i>	51
<i>Appendix G – Vehicle Replacement Assumptions.....</i>	53



List of Figures

Figure 1: Systems by primary purpose	10
Figure 2: Systems by mode	11
Figure 3: Systems by business model.....	12
Figure 4: System locations and passenger boardings	15
Figure 5: Passenger boardings by NPS region.....	16
Figure 6: Systems by passenger boardings.....	17
Figure 7: Passenger boardings by mode.....	18
Figure 8: Passenger boardings by business model.....	19
Figure 9: Fleet ownership by business model	20
Figure 10: Fleet: conventional vs. alternative fuel vehicles by ownership	21
Figure 11: Number of vehicles by fuel type.....	22
Figure 12: Number of systems by fleet size	22
Figure 13: All vehicles by age class (years).....	23
Figure 14: Accessibility of NPS-owned transit vehicles	24
Figure 15: Types of Essential Traveler Information Provided	25
Figure 16: Percent change in boardings from 2012 to 2016	26
Figure 17: Transit system operating schedules, with peak seasons in darker colors.....	27
Figure 18: Distribution of service duration by number of months	28
Figure 19: Estimated net CO ₂ emissions	30

List of Tables

Table 1: NPS transit systems changes between 2012 and 2016 inventories.....	8
Table 2: Count methodology	13
Table 3: Passenger boardings for the 10 highest use transit systems	13
Table 4: Distribution of miles and CO ₂ emissions (metric tons) by vehicle ownership.....	29
Table 5: Estimated net CO ₂ emissions (metric tons) by vehicle ownership.....	30
Table 6: Vehicle age for NPS transit vehicle types	31
Table 7: Estimated NPS-owned shuttle/bus/tram/van overdue recapitalization needs, up to 2016	32
Table 8: Estimated NPS-owned shuttle/bus/tram/van rolling stock capital needs, 2017-2027	33



Acronyms

The following acronyms are used in this report:

ACAD	Acadia National Park
ADAM	Adams National Historic Park
AKR	Alaska Region
ALCA	Alcatraz Island
ALPO	Allegheny Portage Railroad National Historic Site
APIS	Apostle Islands National Lakeshore
ATP	Alternative Transportation Program
ATSLAM	Alternative Transportation Systems Lifecycle Asset Management
BLRI	Blue Ridge Parkway
BOHA	Boston Harbor Islands National Recreation Area
BRCA	Bryce Canyon National Park
BUIS	Buck Island Reef National Monument
CACO	Cape Cod National Seashore
CALO	Cape Lookout National Seashore
CARL	Carl Sandburg Home National Historic Site
CASA	Castillo de San Marcos National Monument
CHIS	Channel Islands National Park
CNG	Compressed Natural Gas
CO ₂	Carbon Dioxide
CRLA	Crater Lake National Park
CUA	Commercial Use Agreement
CUIS	Cumberland Island National Seashore
CUVA	Cuyahoga Valley National Park
DENA	Denali National Park & Preserve
DEPO	Devils Postpile National Monument
DINO	Dinosaur National Monument
DRTO	Dry Tortugas National Park
EISE	Eisenhower National Historic Site
ELIS	Ellis Island
ELRO	Eleanor Roosevelt National Historic Site
EUON	Eugene O'Neill National Historic Site
EVER	Everglades National Park
FBMS	Financial and Business Management System
FIIS	Fire Island National Seashore
FOMA	Fort Matanzas National Monument
FOSU	Fort Sumter National Monument
GLAC	Glacier National Park
GLBA	Glacier Bay National Park & Preserve
GLCA	Glen Canyon National Recreation Area
GOGA	Golden Gate National Recreation Area
GUIS	Gulf Islands National Seashore
GRCA	Grand Canyon National Park
GRTE	Grand Teton National Park
HAFE	Harpers Ferry National Historic Park
HOFR	Home of Franklin D. Roosevelt National Historic Site
IMR	Intermountain Region
ISRO	Isle Royale National Park
JOFL	Johnstown Flood National Memorial
KATM	Katmai National Park & Preserve



KEMO	Kennesaw Mountain National Battlefield Park
LACH	Lake Chelan National Recreation Area
LIBI	Little Bighorn Battlefield National Monument
LOWE	Lowell National Historic Park
MACA	Mammoth Cave National Park
MEVE	Mesa Verde National Park
MPG	Miles per gallon
MUWO	Muir Woods National Monument
MWR	Midwest Region
NAMA	National Mall and Memorial Parks
NCR	National Capital Region
NER	Northeast Region
NLRTP	National Long Range Transportation Plan
NOCA	North Cascades National Park
NPS	National Park Service
ORPI	Organ Pipe Cactus National Monument
PINN	Pinnacles National Park
PIRO	Pictured Rocks National Lakeshore
PORE	Point Reyes National Seashore
PWR	Pacific West Region
ROLA	Ross Lake National Recreation Area
ROMO	Rocky Mountain National Park
SAJU	San Juan National Historic Site
SCBL	Scotts Bluff National Monument
SEKI	Sequoia & Kings Canyon National Parks
SER	Southeast Region
SHEN	Shenandoah National Park
SLBE	Sleeping Bear Dunes National Lakeshore
SOCC	Sustainable Operations and Climate Change
STEA	Steamtown National Historic Site
STLI	Statue of Liberty National Monument
TAPR	Tall Grass Prairie National Preserve
TRIP	Transit in Parks Program
VALR	World War II Valor in the Pacific National Monument
VAMA	Vanderbilt Mansion National Historic Site
VAFO	Valley Forge National Historical Park
VMT	Vehicle Miles Traveled
VOYA	Voyageurs National Park
WOTR	Wolf Trap National Park for the Performing Arts
YELL	Yellowstone National Park
YOSE	Yosemite National Park
ZION	Zion National Park



Introduction

The fifth annual National Park Service (NPS) Transit Inventory and Performance Report communicates the service-wide outcomes and status of NPS transit systems (see Appendix A for acknowledgements). The 2012 inventory¹ was the first comprehensive listing of these systems since 1998, covering surface, waterborne, and air systems. The 2012 inventory established a working definition of NPS transit systems for the purpose of this document; helped NPS comply with 23 U.S Code 203(c),² which requires “a comprehensive national inventory of public Federal lands transportation facilities;” and, fulfilled other internal needs. This national inventory requirement continues today.

The 2016 inventory is meant to assist the NPS:

- Advance NPS transit performance measurement;
- Capture asset management and operational information not tracked in current NPS systems of record;
- Supports the Green Parks Plan, the National Long Range Transportation Plan, Regional Long Range Transportation Plans, A Call to Action, and the Capital Investment Strategy by providing key transit statistics, which can also be used to track progress towards goals;
- Integrate transit data with NPS systems of record, including asset management data in the Facility and Business Management System for NPS-owned vehicles;
- Comply with Executive Order 13514, which requires federal agencies to measure, manage, and reduce greenhouse gas emissions; and
- Communicate program information and projected vehicle (but not infrastructure) recapitalization needs internally and externally.

Updates in the 2016 Inventory

Through the five years of the inventory, the data collection process and final report have improved and evolved. With input from park staff, the data collection tool for the inventory changed from an email based collection, to an Access Database tool, to the current model of an online data collection tool. The online data collection tool stores data from last year to simplify the updating process for park staff. An overriding priority of the effort is to not burden park staff who respond to additional data calls and surveys as well.

Over the five years of the inventory effort, the Transit Inventory Report has expanded to not only communicate information about the NPS transit systems, but also to develop performance measures that align with the Alternative Transportation Program (ATP) goal areas (see Appendix B). This year includes performance measures on operating schedules and information on essential traveler information that each park makes available. There was also additional data collected on transit system route structure that enabled more precise estimations of vehicle emissions, and associated reduction in total emissions by operating the transit systems.

¹ NPS National Transit Inventory, 2012, available at http://ntl.bts.gov/lib/47000/47800/47871/NPS_WASO_2013_Transit_Inventory.pdf.

² 23 U.S. Code 203 Federal lands transportation program: <https://www.gpo.gov/fdsys/pkg/USCODE-2014-title23/pdf/USCODE-2014-title23-chap2-sec203.pdf>.



Additionally, the 10 profiles of the transit systems that precede the transit inventory data communicate the value of the transit systems in National Parks, and demonstrate how the NPS leverages external partners and the private sector to offer these critical services to visitors.

The list of systems included in the report was re-evaluated to ensure that all of the systems meet the definition of transit used for this report (see below and Appendix C for full definition). As a result, 28 systems included in 2015 were removed for this 2016 report. These included 11 systems operating under a commercial use agreement (CUA), and 17 chartered services.

Data Collection and Methodology

Each year, the NPS uses the same objective definition of NPS transit systems for the transit inventory to ensure consistent data collection across the nation and over time. Only units with systems that meet each of the following three criteria are included in this effort (see Appendix B for more information):

1. Moves people by motorized vehicle on a regularly scheduled service;³
2. Operates under one of the following business models: concessions contract; service contract; partner agreement including memorandum of understanding, memorandum of agreement, or cooperative agreement (commercial use agreements are not included); or NPS-owned and operated;⁴ and
3. All routes and services at a given unit that are operated under the same business model by the same operator are considered a single NPS transit system.

The 2016 NPS Transit Inventory is limited to systems in which the NPS either has a direct financial stake or has committed resources to develop a formal contract or agreement.

The majority of systems tend to collect information on a calendar year cycle (January through December), therefore the following information was collected for the 2016 calendar year:

- Transit system name and description;
- Passenger boardings;
- Business model;
- System purpose;
- System type/mode;
- Vehicle information including fuel type, capacity, service miles, accessibility, and age (individual vehicle information for NPS-owned vehicles and system-level information for non-NPS vehicles);
- Vehicle information that is mandatory in the NPS's Financial and Business Management System (FBMS);
- Owner and operator type (NPS or non-NPS) and contact information;
- Operating schedule; and
- Participation of a local transit agency in the service.

³ Services with a posted schedule that have standard operating seasons/days of week/hours. Services which do not operate on a fixed route, or exist for the sole purpose of providing access to persons with disabilities, are not included.

⁴ For the purposes of the NPS transit inventories, no distinction is drawn between memorandum of understanding, memorandum of agreement, and cooperative agreement. All are recorded as "cooperative agreement."



The following steps were taken to update the inventory:

- Using the 2015 National NPS Transit Inventory as a starting point, regional transportation program coordinators identified new, closed, or consolidated systems, and updated unit contact information.
- 64 park units provided information primarily using an online form, or through email or phone. Some parks reported incomplete information because they do not track the requested service information or they could not provide the information before the end of the data collection period. All units responded except for one,⁵ representing a single transit system.

Appendix D includes a full list of surveyed transit systems by region. Appendix E includes a list of the transit systems that were removed from the 2016 inventory.

Inventory Results

Detailed findings of the 2016 inventory are presented in the following sections:

- Inventory Base Data
- System Characteristics
- Passenger Boardings
- Vehicle Data
- Performance Measures

Inventory Base-Data

Table 1 summarizes the differences in key results of the NPS National Transit Inventory and Performance Report from 2012 through 2016.

Table 1: NPS transit systems changes between 2012 and 2016 inventories

Source: 2012 - 2016 NPS National Transit Inventory data

Key Findings	2012	2013	2014	2015	2016
Number of Systems	147	131	121	127	100
Number of Parks Represented	68	66	63	64	64
Passenger Boardings	33.6 million	26.9 million	36.5 million	42.9 million	43.6 million
<i>Excluding 10 highest ridership systems</i>	6.1 million	5.9 million	5.6 million	7.2 million	7.0 million
Number of Vehicles	890	927	982	1,022	843
<i>NPS-Owned</i>	323	278	274	275	278
<i>Non-NPS</i>	567	651	708	747	565
Systems operated by Local Transit Agency	12	12	12	13	13

⁵ San Juan National Historic Site did not provide data for its tram service.



Aside from the 28 systems that were removed due to their CUA contracting structure or chartered operations, all systems that were active in 2015 were still active in 2016. One system was added to the inventory in 2016, the Island Express Ferry at Cape Lookout National Seashore (CALO). Between these changes, the total number of transit systems recorded in the inventory decreased from 127 to 100 systems.

There were approximately 700,000 more total boardings in 2016 compared to 2015, representing a 1.6 percent increase in passenger boardings (and accounting for the subtraction of smaller systems from the inventory). The Zion National Park (ZION) Canyon Shuttle experienced the largest increase of 13 percent (695,000 boardings), and the Statue of Liberty National Monument (STLI) Ferries boardings increased by 6 percent, or 608,000 boardings. The increase in boardings may be due in part to the NPS Centennial, which was in 2016. Throughout 2016, there were various initiatives promoting the 100th anniversary of the NPS, and 2016 saw the highest overall visitation to all units across the NPS.

One system (SAJU) did not provide updated 2016 inventory data. This system is excluded from any operations-related information presented (e.g. passenger boardings, service miles), but is included in general inventory data, since the vehicle type, system purpose, and business model did not change.

System Characteristics

The 2016 inventory identified 100 discrete transit systems throughout 64 of the total 417 NPS units. Figure 1, Figure 2, and Figure 3 place these systems in the context of primary system purpose, mode, and business model. Results for system characteristics in 2016 are similar to the results reported previously in 2015, while reflecting the decrease in the total number of systems, due to recharacterizing the systems under CUAs and charters.

System Purpose & Mode

There are five purposes identified for transit systems and unit staff identified which one was the primary purpose for each system. System purposes are described below and depicted in Figure 1 and described below:

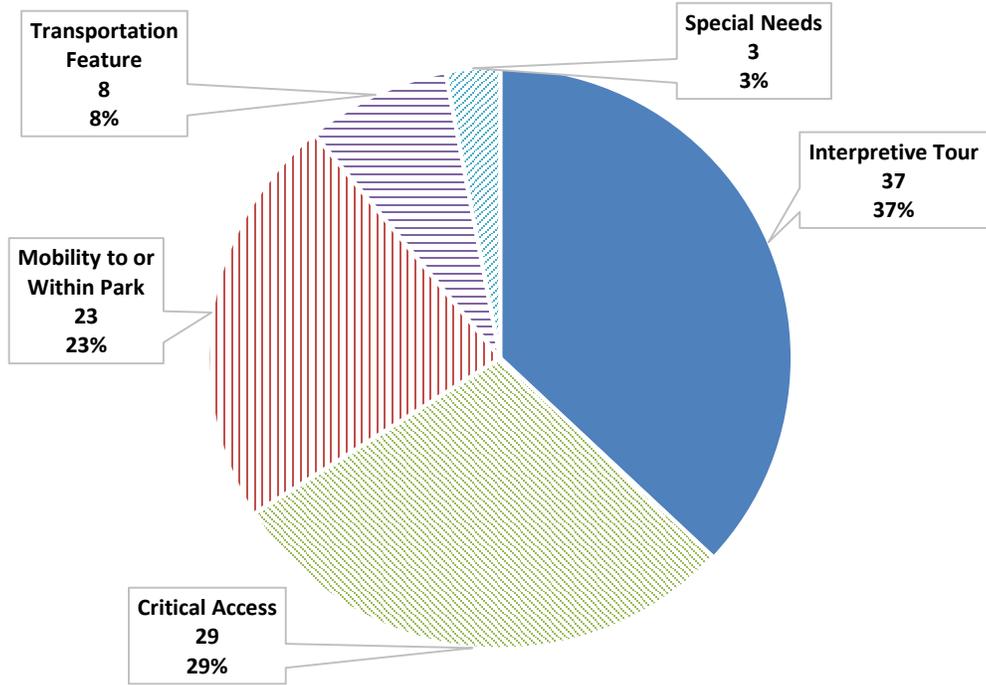
- 37 systems are guided **interpretive tours**;⁶
- 23 systems provide **mobility to or within a park** as a supplement to private automobile access;
- 29 systems provide **critical access** to an NPS unit or site that is not readily accessible to the public due to geographic constraints, park resource management decisions, or parking lot congestion;
- 8 systems are considered a **transportation feature** (a primary attraction of the park unit); and,
- 3 systems are primarily designed to meet the accessibility needs of visitors with **special needs**.

⁶ As the definition of interpretive tours was revisited in 2016, some of the systems previously listed as interpretive tours were removed, as described in previous sections.



Figure 1: Systems by primary purpose
(N=100 systems)

Source: 2016 NPS National Transit Inventory data

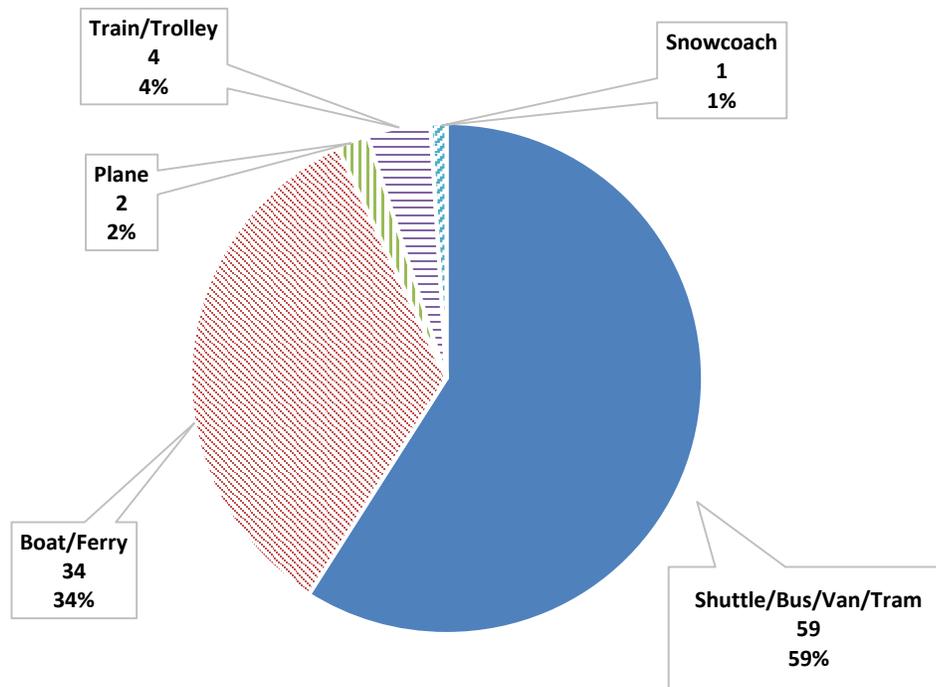


The majority of the transit systems are shuttle/bus/van/tram systems (59 percent), followed by boat/ferry (34 percent), plane (2 percent), trains/trolley (4 percent), and snowcoach (1 percent) (see Figure 2).

Figure 2: Systems by mode

(N=100 systems)

Source: 2016 NPS National Transit Inventory data



Business Models

There are four types of business models under which the 100 NPS transit systems operate, as shown in Figure 3 and described below:

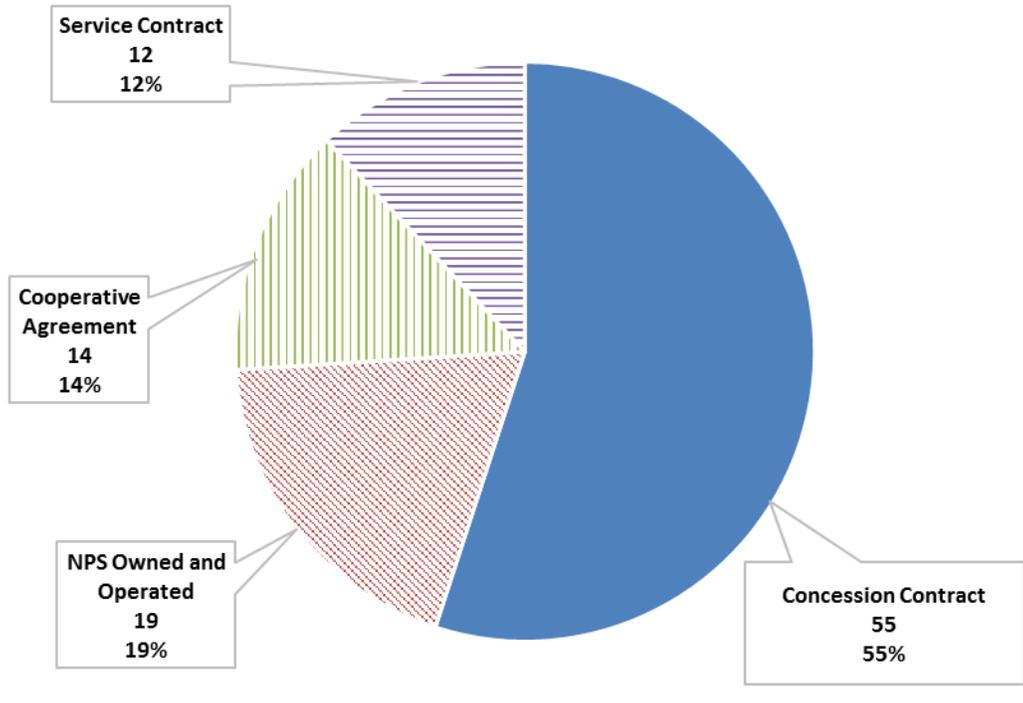
- **Concession Contracts:** The majority of identified transit systems, 55 systems, operate through concession contracts under which a private concessioner pays the NPS a franchise fee to operate inside a unit. Seven concession contract systems utilize vehicle fleets owned by the NPS.
- **Service Contracts:** Transit systems that are primarily owned and operated by a private firm fall under service contracts. In 2016, 12 transit systems operated under a service contract. Five service contract systems utilize vehicle fleets owned by the NPS.
- **Cooperative Agreements:** A local government agency or nonprofit operated 14 of the transit systems under a cooperative agreement.
- **NPS Owned and Operated:** The NPS owned and operated 19 of the park transit systems.⁷ These systems tend to be small and provide critical access to a park or park site, are interpretive tours, provide service for special needs visitors, or are a park transportation feature not easily provided by a private operator.

⁷ In total, the NPS owns vehicle fleets for 33 systems, operating 19 of those systems. The remaining systems are operated through concession contracts (7), cooperative agreements (2), and service contracts (5).



Figure 3: Systems by business model
(N=100 systems)

Source: 2016 NPS National Transit Inventory data



Passenger Boardings

In 2016, there were 43.6 million passenger boardings across all NPS transit systems.⁸ If the 99 reporting systems (not counting SAJU) were considered one enterprise compared to transit agencies across the country in the National Transit Database, that enterprise would rank 39th in the country, just after LA County Metro, in terms of passenger boardings.⁹ Excluding concession contracts and cooperative agreements, NPS owned and operated systems and service contract systems reported 16.6 million trips in 2016.

Table 2 summarizes the methodologies park units use to count boardings. Systems indirectly record most passenger boardings through manual counts (19.8 million) and ticket sales (16.1 million). Estimated, automated, and other counter methodologies account for approximately 7.7 million passenger boardings.

⁸ A “passenger boarding” or “unlinked trip” occurs each time a passenger boards a vehicle. This is an industry standard measure used in the Federal Transit Administration’s National Transit Database.

⁹ Federal Transit Administration National Transit Database, 2016 data. <https://www.transit.dot.gov/ntd>.



Table 2: Count methodology**(N = 99 systems¹⁰)**

Source: 2016 NPS National Transit Inventory data

Count Methodology	Number of Systems	Passenger Boardings (Millions)
Ticket Sales	46	16.1
Manual Counts	40	19.8
Estimated	4	4.4
Automated Counter	3	3.1
Other	6	0.2

Approximately 83.7 percent (36.5 million) of boardings on NPS transit systems in 2016 are attributable to the 10 highest use transit systems (by boardings). Table 3 summarizes these systems and shows passenger boardings for 2016. Passenger boardings increased in 2016 for 6 of the top 10 systems.

Table 3: Passenger boardings for the 10 highest use transit systems

Source: 2016 NPS National Transit Inventory data

Rank	Park	System Name	2016 Boardings	Business Model	System Purpose
1	STLI/ELIS	Statue of Liberty Ferries	10,951,032	Concession Contract	Critical Access
2	GRCA	South Rim Shuttle Service	7,358,095	Service Contract	Mobility to or within park
3	ZION	Zion Canyon Shuttle	5,993,148	Service Contract	Critical Access
4	YOSE	Yosemite Valley Shuttle	3,728,374	Concession Contract	Mobility to or Within Park
5	GOGA/ALCA	Alcatraz Cruises ferry	2,811,578	Concession Contract	Critical Access
6	VALR	USS Arizona Memorial Tour	2,573,392	Cooperative Agreement	Critical Access
7	NAMA	Big Bus Tours Washington DC ¹¹	1,062,045	Concession Contract	Interpretative Tour
8	SEKI	Giant Forest Shuttle	735,453	Cooperative Agreement	Mobility to or Within Park
9	ROMO	Bear Lake & Moraine Park shuttle, Hiker Shuttle to Estes Park	705,766	Service Contract	Critical Access
10	BRCA	Bryce Canyon Shuttle and Rainbow Point Shuttle	627,246	Service Contract	Interpretive Tour

¹⁰ An N of 99 is used to exclude the one system that did not provide boarding information for 2016.

¹¹ In 2014, the Volpe Center completed a study on passenger boardings for NAMA Big Bus Tours Washington, DC. The multiplier was used to calculate 2016 boardings.



High-ridership shuttle systems are primarily provided via service contracts, while a greater proportion of the high-ridership water-based systems are provided through concession contracts. This likely reflects a greater business case for bidding out specialized water-based systems to concessioners. In many cases, these systems provide critical access to parks and park sites. High-ridership systems are located primarily in the NPS Intermountain and Pacific West Regions.

The NPS continued to partner with 13 local transit agencies in 2016. Those partnerships accounted for 6.2 million passenger boardings in 2016. Passenger boardings among NPS owned and operated systems (20 systems) accounted for approximately 616,000 passenger boardings. Most of these systems either provide critical access to a unit/site or an interpretive experience for visitors.

The Intermountain, Northeast, and Pacific West NPS regions each reported more than 11 million passenger boardings in 2016, far exceeding other regions; however, if the 10 highest use systems were removed from consideration, each region ranged from 400,000 to 1.4 million passenger boardings in 2016. Figure 4 shows the geographic distribution of the systems—along with the passenger boardings—and Figure 5 shows passenger boardings by region.



Figure 4: System locations and passenger boardings
(N=99 systems)

Source: 2016 NPS National Transit Inventory data

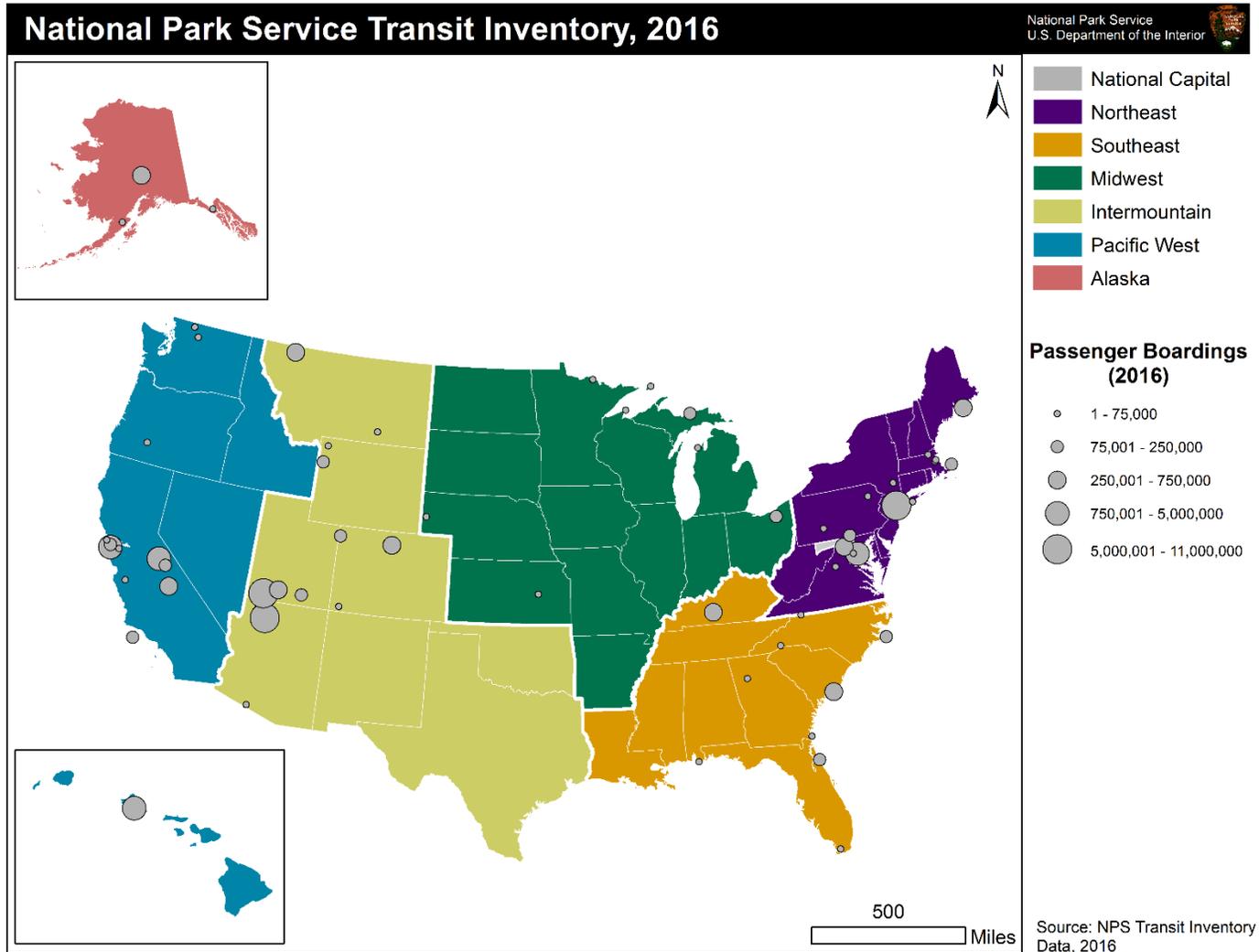


Figure 5: Passenger boardings by NPS region
(N=99 systems)

Source: 2016 NPS National Transit Inventory data

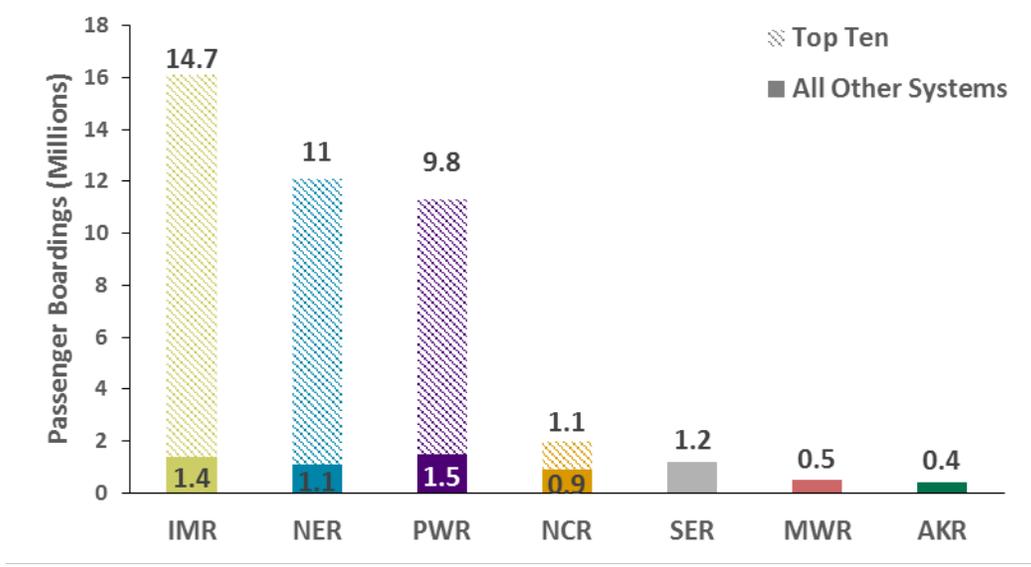
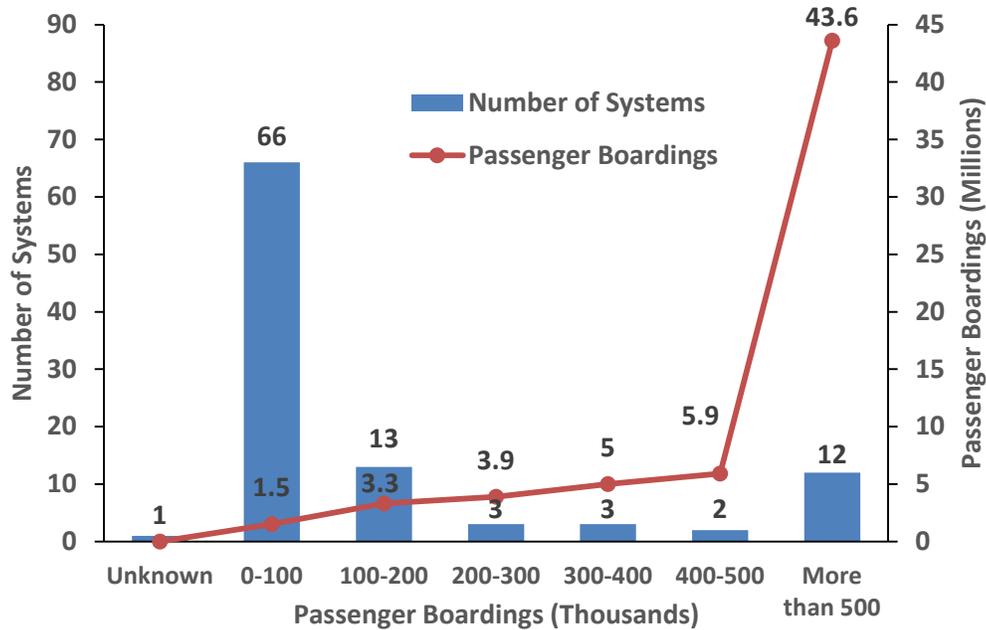


Figure 6 depicts the number of systems and the cumulative total number of passenger boardings at different ranges of passenger boardings. The chart illustrates that while only 12 transit systems have over 500,000 passenger boardings, these systems comprise the largest cumulative total number of passenger boardings. Furthermore, 66 transit systems had fewer than 100,000 passenger boardings, comprising 1.5 million of the total passenger boardings in 2016.

Figure 6: Systems by passenger boardings
(N=100 systems)

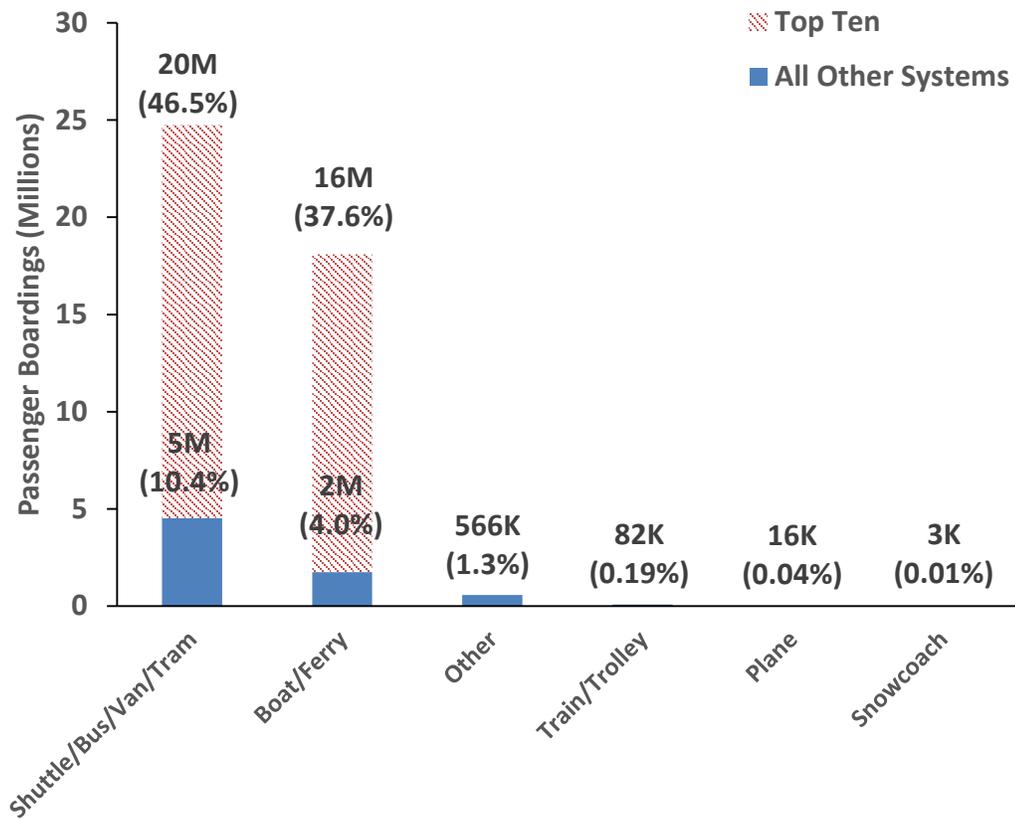
Source: 2016 NPS National Transit Inventory data



Over half of passenger boardings were on shuttles/buses/vans/trams systems (57 percent) and just under half were on boats/ferries (42 percent). Trains/trolleys, planes, snowcoaches, and other accounted for only about two percent of all passenger boardings (see Figure 7).

Figure 7: Passenger boardings by mode
(N=99 systems)

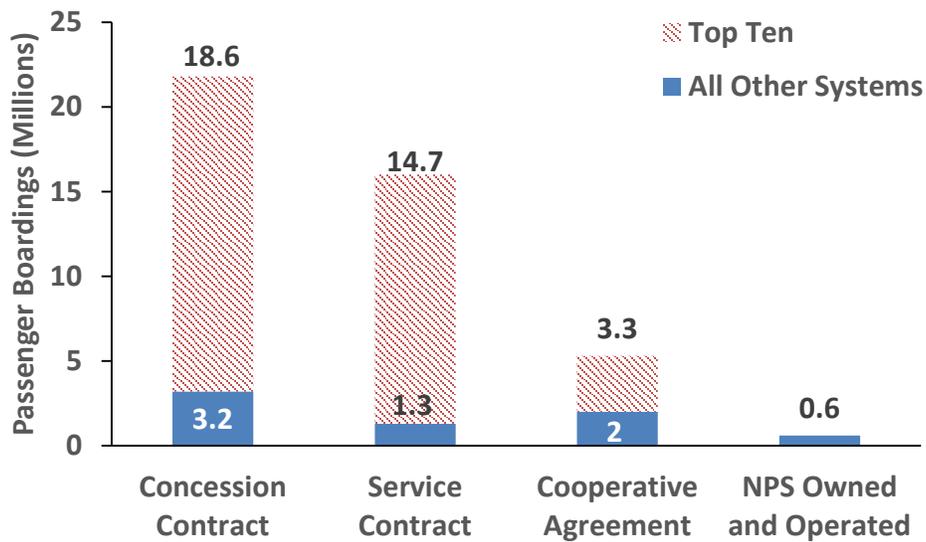
Source: 2016 NPS National Transit Inventory data



Half of passenger boardings (49.9 percent) took place on systems operated under concession contracts. Service contracts carried 36.6 percent of passenger boardings, 12.1 percent under cooperative agreements, and 1.4 percent under NPS owned and operated systems (see Figure 8). Excluding the 10 highest use systems, concession contracts and cooperative agreements accounted for the majority of boardings.

Figure 8: Passenger boardings by business model
(N=99 systems)

Source: 2016 NPS National Transit Inventory data



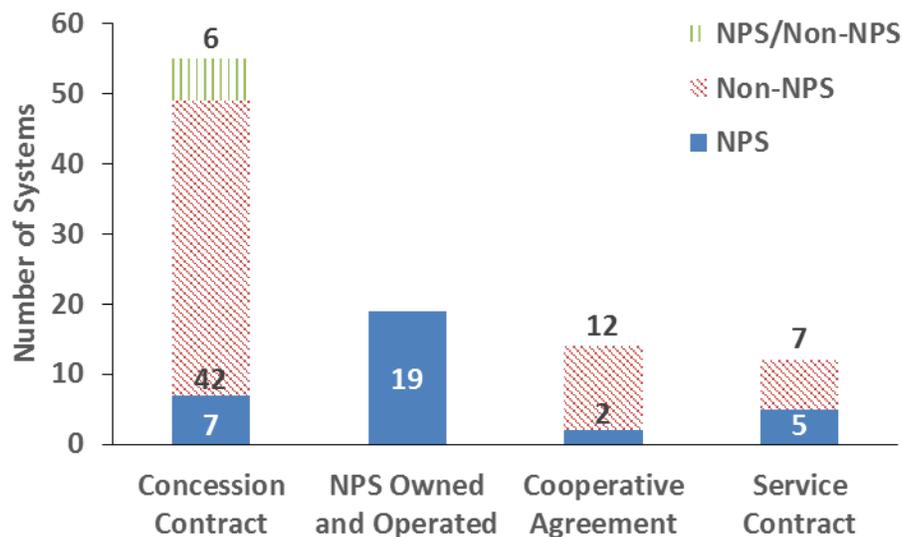
Vehicles

Vehicle Fleets

Over half of the identified transit systems (55 systems, or 55 percent) operate under concession contracts, of which seven systems utilize vehicle fleets owned exclusively by the NPS.¹² These seven fleets are among the 33 total fleets owned by the NPS. The NPS owned and operated 19 of the transit systems (19 percent). These owned and operated systems tend to be small and provide critical access to a park or park site, are interpretive tours, provide service for special needs visitors, or are a park transportation feature not easily provided by a private operator. Transit systems managed through cooperative agreements account for 14 of the systems (14 percent), of which two of these systems utilize vehicle fleets owned exclusively by the NPS. The remaining 12 transit systems (12 percent) are operated under service contracts, of which five¹³ of these systems utilize vehicle fleets owned by the NPS, including the large surface transportation systems at Grand Canyon National Park and Zion National Park.

Figure 9: Fleet ownership by business model
(N=100 systems)

Source: 2016 NPS National Transit Inventory data



¹² The seven systems operating NPS-owned vehicles under a concession contract are: Cumberland Island Land and Legacies Tour, Glacier Red Bus Tours, North Cascades Rainbow Falls Tours, Yellowstone Historic Yellow Bus Tours, Yosemite Badger Pass-Glacier Point Shuttle, Yosemite Tuolumne Shuttle, and the Yosemite Valley Shuttle.

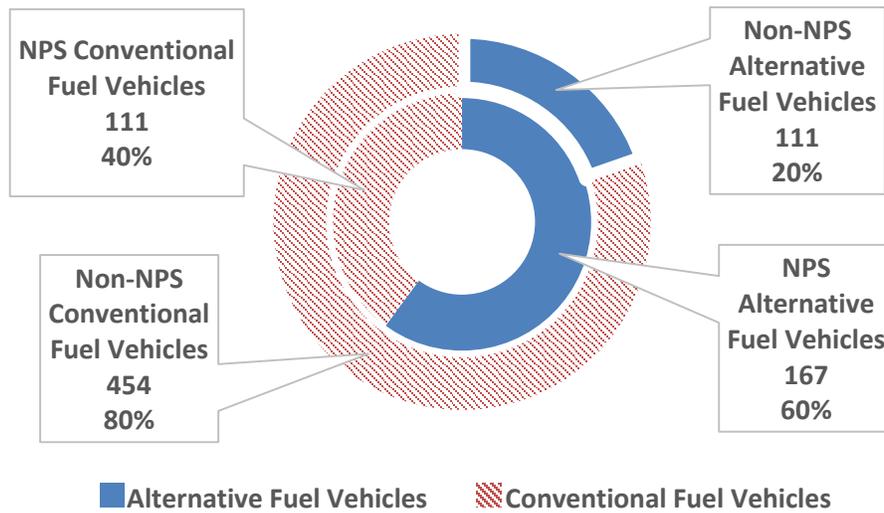
¹³ The five systems operating NPS-owned vehicles under a service contract are: Adams Trolley, Grand Canyon South Rim Shuttle, Harper's Ferry shuttle, Kennesaw Mountain shuttle, and the Zion Canyon shuttle.



The NPS transit fleet is comprised of vehicles operating on both conventional and alternative fuels (the alternative fuel category includes electric and hybrid-electric vehicles, which are shown in Figure 11).¹⁴ The NPS-owned fleet has 278 vehicles, of which 60 percent are classified as alternative fuel vehicles and 40 percent as conventional vehicle fuel. The non-NPS-owned fleet is larger with 565 vehicles, of which 20 percent of the fleet classifies as alternative fuel vehicles and 80 percent classifies as conventional vehicle fuel (see Figure 10 and Figure 11). The combined fleet of NPS-owned and non-NPS-owned vehicles contains 843 vehicles, of which 33 percent are classified as alternative fuel vehicles and 67 percent as conventional vehicle fuel. Most systems operate between 1 and 10 vehicles and most larger systems are not owned by the NPS (see Figure 12).

Figure 10: Fleet: conventional vs. alternative fuel vehicles by ownership
(N=843 vehicles)

Source: 2016 NPS National Transit Inventory data



¹⁴In addition to electric and hybrid-electric vehicles, the alternative fuel category includes vehicles powered by propane, compressed natural gas (CNG), biodiesel, and other alternative fuels.



Figure 11: Number of vehicles by fuel type
(N=843 vehicles)

Source: 2016 NPS National Transit Inventory data

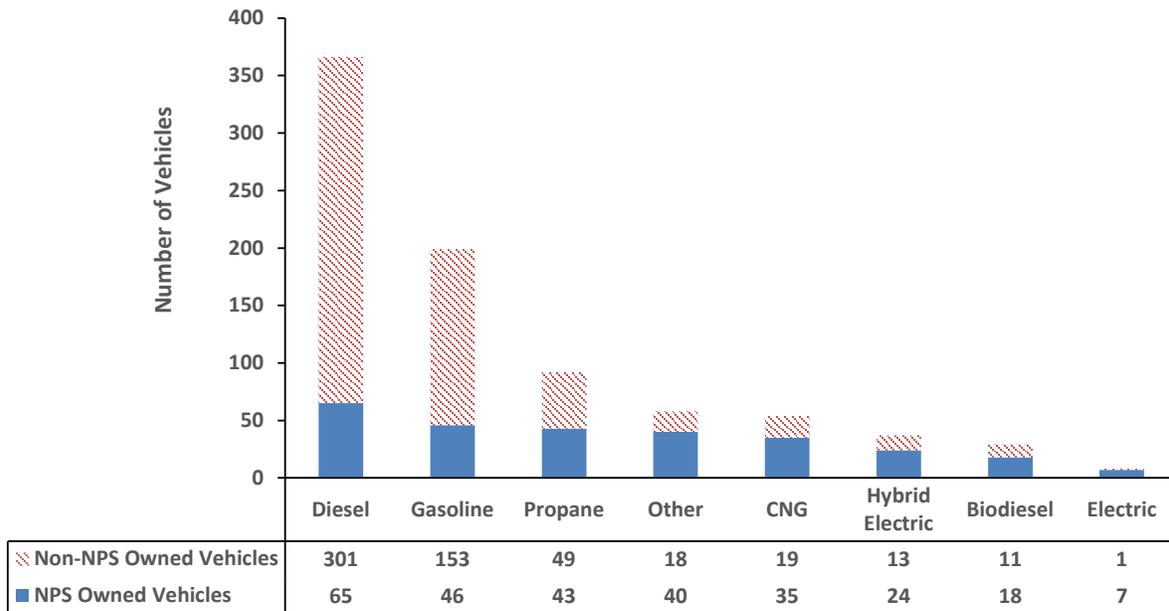
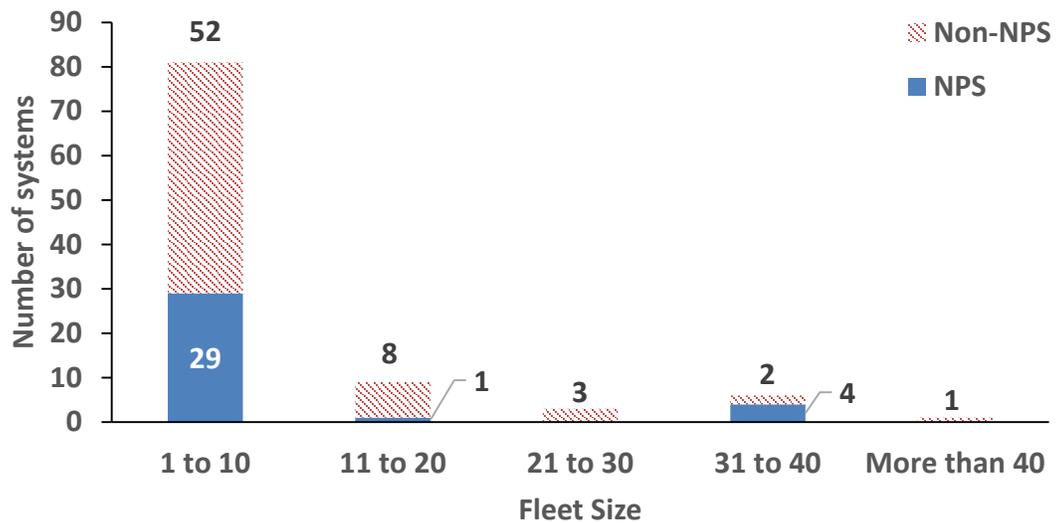


Figure 12: Number of systems by fleet size
(N = 100 systems)

Source: 2016 NPS National Transit Inventory data



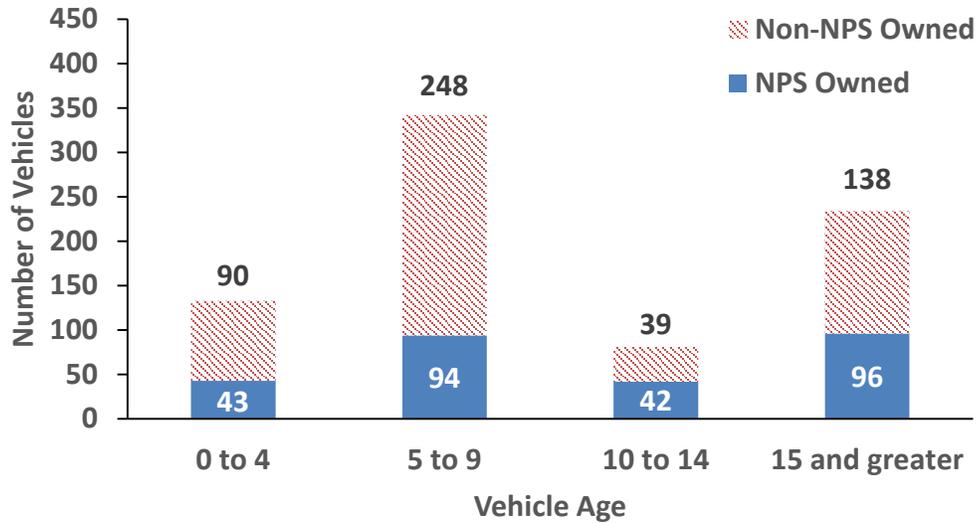
Average Age of Vehicles by Vehicle Type

The majority of vehicles in park transit systems are between 5-9 years old, or 15 years old and greater. A large portion of the vehicles in the 15 years and greater age bracket are owned by non-NPS entities, which could indicate that private sector partners may face significant recapitalization needs in the coming years (see Figure 13). In some cases, this could have implications for a contractor's financial ability to carry out or rebid a contract.

Figure 13: All vehicles by age class (years)

(N = 790 vehicles)

Source: 2016 NPS National Transit Inventory data



Performance Measures

The NPS ATP seeks to manage the transportation program based on meaningful, reliable data. The objective is to use measurable, applicable, and achievable performance measures and metrics to guide and support decision-making and management of NPS transit systems.

The previous NPS transit inventories (2012-2015) reported performance-oriented findings for CO₂ emissions and fleet recapitalization needs and costs, and the 2016 transit inventory includes these measures and builds upon them.

The performance measures below are split into the following sections which correspond to ATP goals and the [NPS National Long Range Transportation Plan](#) (NLRTP): visitor experience; operations; environmental impact; and, asset management. The ATP program goals are included in Appendix B.

Visitor Experience

This performance area addresses how park transportation systems enhance the visitor experience. For 2016, the performance measures for visitor experience include accessibility for disabled park visitors and the availability of transit information.

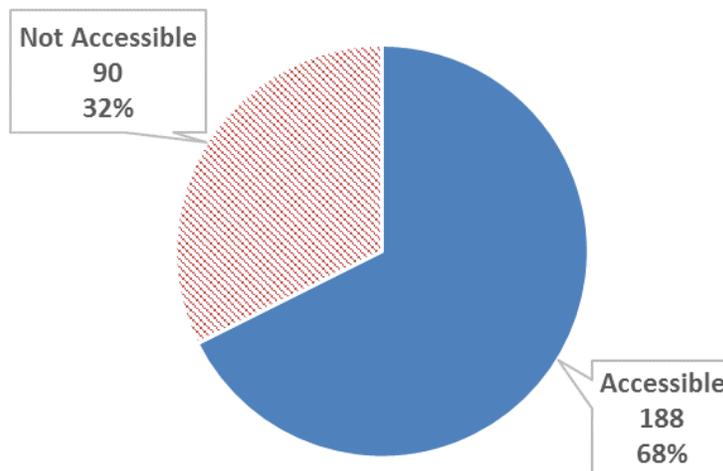
Accessibility for Disabled Visitors

In 2016, the majority (68 percent, 188 vehicles) of NPS-owned transit vehicles are accessible for people with mobility impairments (see Figure 14). At the park level, there are 28 parks with NPS-owned vehicles, and 7 out of the 28 parks with NPS-owned vehicles do not have any vehicles that are accessible.

Figure 14: Accessibility of NPS-owned transit vehicles

(N = 278 vehicles)

Source: 2016 NPS National Transit Inventory data



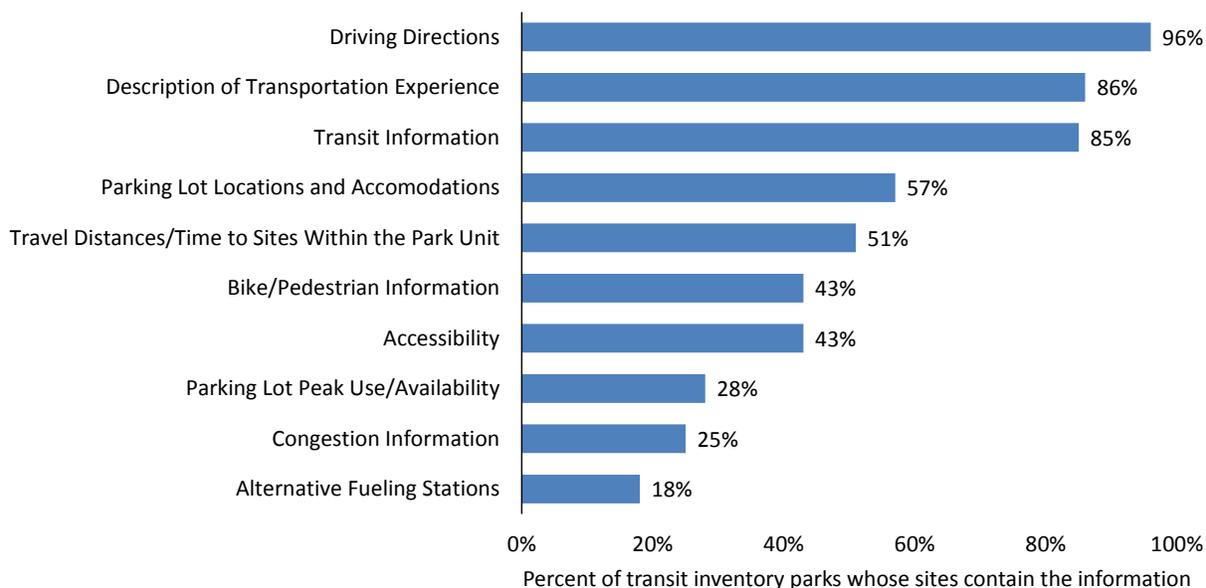
Essential Traveler Information

One of the NPS NLRTP objectives is to “provide state-of-the-art traveler information and wayfinding, and where appropriate, interpretation and education opportunities that complement transportation options.” A separate effort¹⁵ assessed the number of parks whose websites contained each of these elements. Providing complete and appropriate park transit information makes it possible for visitors to make informed transportation choices ahead of their visit, which is especially important when visiting parks where vehicular access is limited or completely restricted.

As shown below, 85 percent of parks with transit systems in the 2016 Transit Inventory provide transit information on their websites, and 43 percent provide Bike/Pedestrian Information and Accessibility Information (see Figure 15).

Figure 15: Types of Essential Traveler Information Provided

Source: NPS Denver Service Center



Operations

The measures in this area evaluate the operational performance of the NPS transit systems by measuring the percent change in boardings from 2012-2016, and the transit system operational service dates.

Year-to-Year Trends in Boardings

The graph below shows the percent change in boardings from 2012-2016 (see Figure 16). During this period, the total boardings across NPS transit systems initially decreased in 2013 due to damage from Hurricane Sandy and the government shutdown.¹⁶ Subsequently, boardings increased significantly in 2014. Although boardings continued to increase in 2015 and 2016, the percent increase declined.

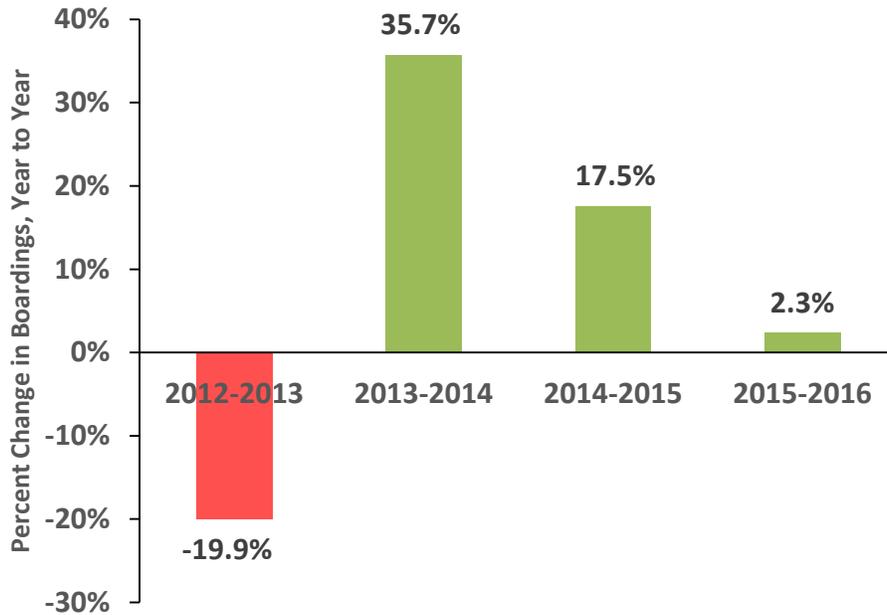
¹⁵ Essential Traveler Information was collected by the NPS Denver Service Center.

¹⁶ See the 2013 NPS Inventory Report:
http://ntl.bts.gov/lib/52000/52400/52470/NPS_WASO_2014_National_Transit_Inventory.pdf.



Figure 16: Percent change in boardings from 2012 to 2016

Source: NPS National Transit Inventory data



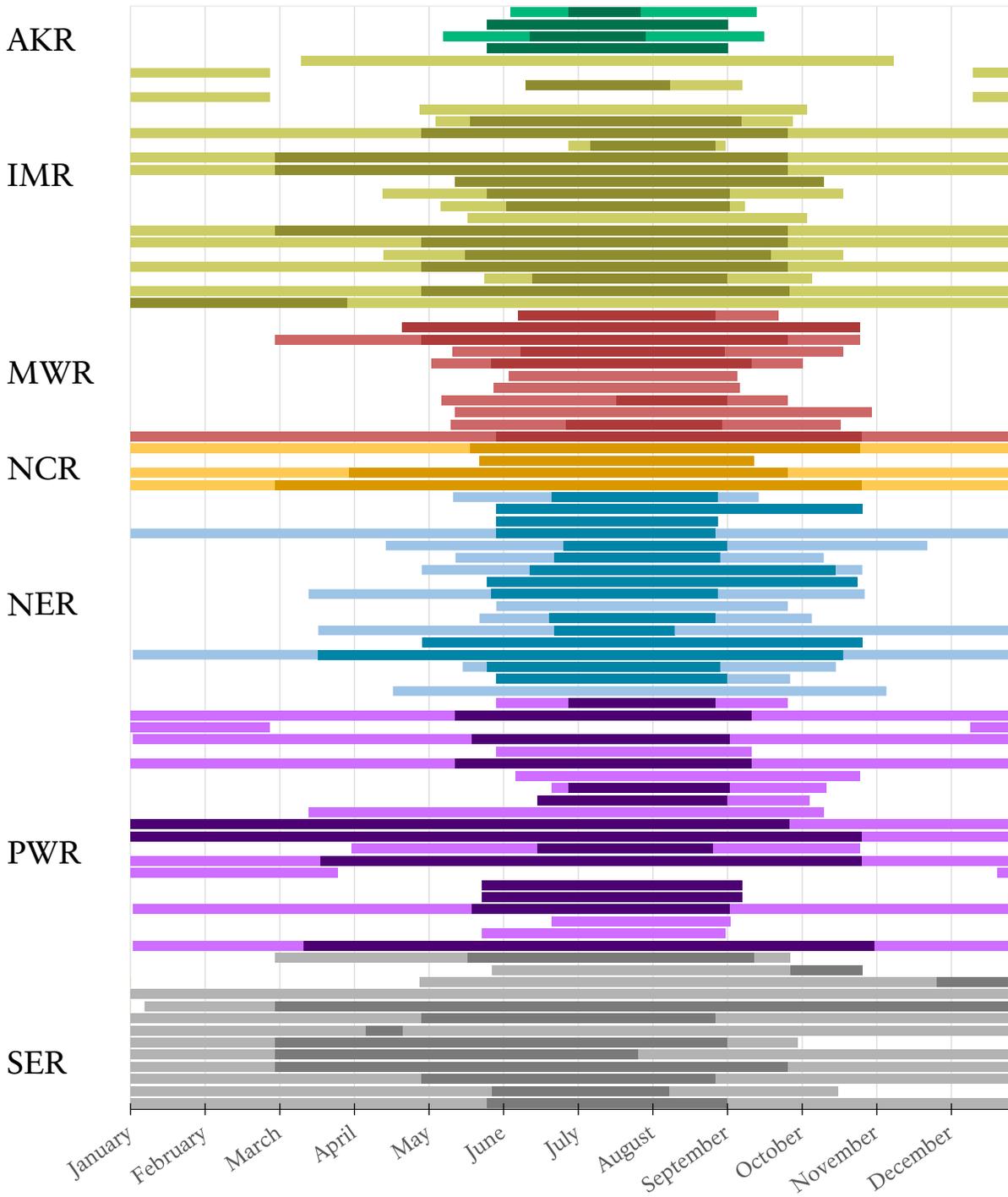
Service Schedule

The 2016 inventory contains data on the service schedules of 91 of the 100 systems in the 2016 inventory, 31 of which reported year-round service—more than 360 days of service per year (see Figure 17). Nine systems did not report service start or end dates. Although most seasonal service dates ranged primarily over the summer months (June to October), four systems operated primarily in the winter (December to February). The most common peak service months are July and August, though some begin as early as January and end as late as October. Peak season is defined as the period when the scheduled transit service is operating at its greatest frequency.



Figure 17: Transit system operating schedules, with peak seasons in darker colors

Source: National Transit Inventory Data

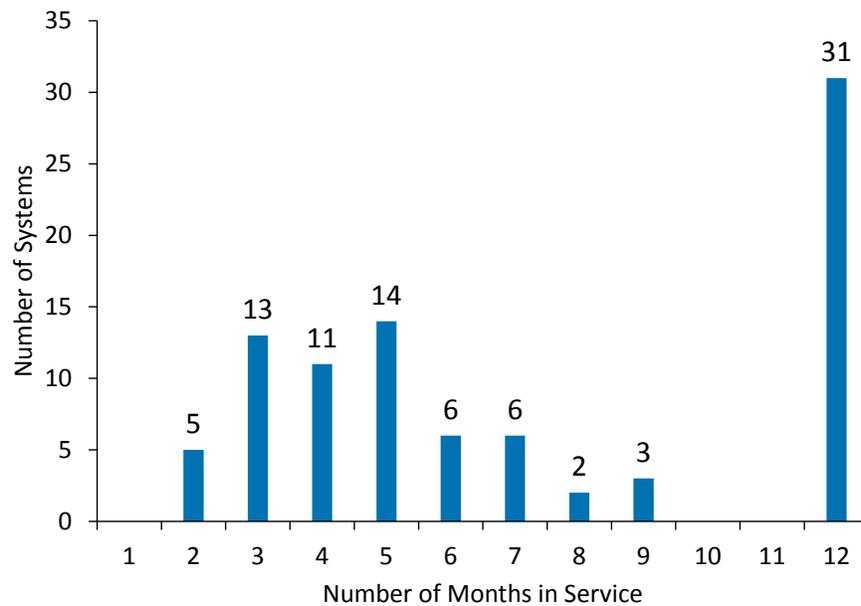


Transit systems in colder climates tended to operate for shorter seasons than those in the south. For example, systems in the Alaska Region operated no earlier than May and no later than September. Many Midwest Region transit systems also had shorter seasons. Conversely, many of the year-round systems are in the Southeast Region, with a few operating in the Intermountain Region and the Pacific West Region. The wide range of climates that the Pacific West encompasses—from Yosemite to Hawaii—led to a wide range of schedules.

The lengths of service period varies from park to park. Out of the 91 transit systems that reported a service period, the majority (31 systems) are in service for all 12 months of the year. Many of these year-round systems are among those with the highest annual ridership. The next most common service period is 2 to 3 months out of the year (18 systems), followed by systems that are in service for 5 months (14 systems).

Figure 18: Distribution of service duration by number of months

Source: National Transit Inventory Data



Environmental Impact

The 2016 environmental impact measures include estimated annual CO₂ emissions of the bus/shuttle/van/tram systems and the corresponding estimated emissions avoided by visitors using these systems instead of personal automobiles. Additionally, it includes the percentage of NPS transit vehicles that are electric or use alternative fuels.

Annual CO₂ Emissions

Of 54 total ground-based transit systems in the 2016 inventory, 48 provided adequate information for the emissions analyses. These 48 shuttle/bus/van/tram systems emitted an estimated 11,639 metric tons of CO₂ in 2016. To put this into perspective, the Federal Highway Administration reports that in 2015 the average driver in the U.S. drove 11,327 miles, burning 475 gallons of gasoline and emitting 3.8 metric tons



of CO₂.¹⁷ It would take 3,063 such drivers to generate the equivalent of the reported NPS shuttle/bus/van/tram system emissions.

Even though the NPS only owns 37 percent of the vehicles, those vehicles travel 46 percent of the mileage across all transit systems in the inventory. Furthermore, NPS vehicles only account for 42 percent of emissions. NPS-owned vehicles travel more miles on average than non-NPS vehicles, with less environmental impact (Table 4).

Table 4: Distribution of miles and CO₂ emissions (metric tons) by vehicle ownership (N = 48 systems)

Source: 2016 NPS National Transit Inventory data

	Vehicles		Miles Traveled		CO ₂ (Metric Tons)	
	#	%	#	%	#	%
NPS Owned	237	37	3.09M	46	4,917	42
Non-NPS Owned	396	63	3.59M	54	6,722	58

CO₂ Emissions Avoided

The more occupants in a transit vehicle, the more emissions are avoided because of the higher efficiency of the transit vehicle relative to the corresponding number of private automobiles. Emissions analysis in previous years relied on estimating emissions at varying vehicle utilization rates. For 2016, a more advanced methodology allowed for a pinpoint estimate of net emissions. This advanced methodology is based on the boardings, service miles, and runs reported by park transit systems.

Table 5 and Figure 19 show net emissions by vehicle ownership for the 48 shuttle/bus van/tram systems where parks provided sufficient data.¹⁸ NPS-owned systems avoided 24,753 metric tons of CO₂ emissions. Non-NPS-owned systems avoided 7,253 metric tons of CO₂ emissions.

In total, park visitors using transit instead of driving their personal vehicles contributed to an estimated 32,006 metric tons of CO₂ emissions avoided. This has an environmental impact equivalent to removing 8,423 light duty vehicles from operation for an entire year.

For more information on emissions estimation methodology, see Appendix F.

¹⁷ US Department of Transportation Federal Highway Administration Office of Highway Policy Information, Highway Statistics 2015, Table VM-1. <https://www.fhwa.dot.gov/policyinformation/statistics/2015/pdf/vm1.pdf>

¹⁸ Boat/ferry systems do not replace vehicle trips and therefore are not included in this analysis. There was limited data collection for system types other than shuttle/bus/van/tram. This study does not estimate emissions mitigated by electric vehicles because it did not collect detailed information about local power generation.



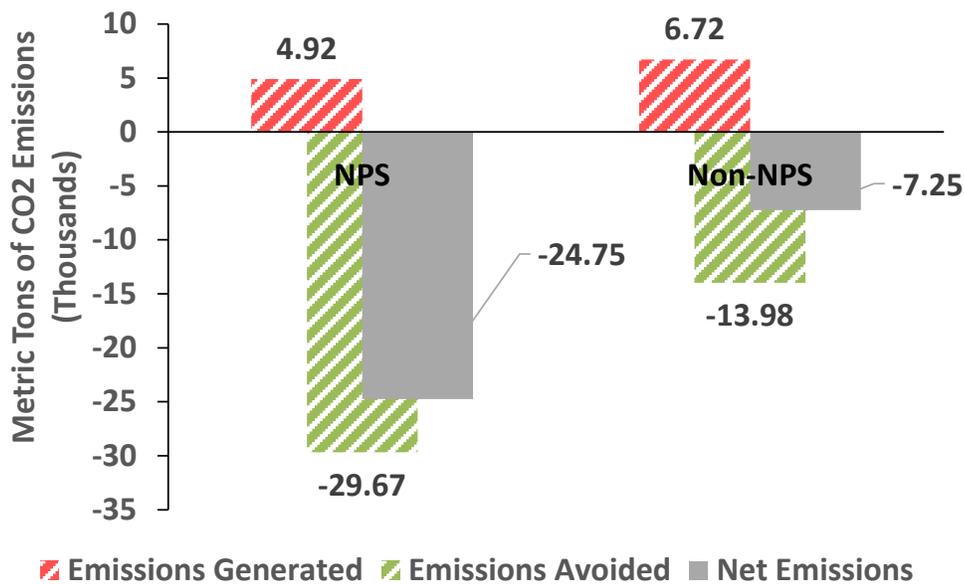
Table 5: Estimated net CO₂ emissions (metric tons) by vehicle ownership
(N = 48 systems)

Source: 2016 NPS National Transit Inventory data

	Estimated Net Emissions (metric tons)
Non-NPS-Owned Systems	-7,253
NPS-Owned Systems	-24,753
Total	-32,006

Figure 19: Estimated net CO₂ emissions
(N = 48 systems)

Source: 2016 NPS National Transit Inventory data



Alternative Fuel and Electric Vehicles

In 2016 60 percent of the NPS fleet was electric, hybrid-electric, or used alternative fuels, while 40 percent used conventional fuel. For non-NPS owned vehicles, 20 percent of transit vehicles were classified as using alternative fuels, or as electric/ hybrid-electric (see Figure 10).



Asset Management

Performance measures in this area help support the long-term financial viability of the NPS transit systems through tracking the age of NPS vehicle fleets, and projected fleet recapitalization costs.

Average Age of NPS Vehicles

Table 6 reports the aggregate average age for NPS-owned transit vehicles service-wide. The average age of each NPS vehicle type is below the service life, for all the vehicle types where data is available. The medium-duty transit vehicles are on average the closest to the end of their service lives, while school buses are among the newest vehicles.

Table 6: Vehicle age for NPS transit vehicle types
(N=242 vehicles)

Source: 2016 NPS National Transit Inventory data

Vehicle Type	Average Age	Service Life (Years)	Number of Vehicles
6-12 pax Electric Tram	8.2	11	9
Passenger Van	5.2	10	6
Light-Duty Shuttle	8.4	15	41
Medium-Duty Shuttle	7.0	15	27
Heavy-Duty Shuttle ¹⁹	8.8	15	55
Medium-Duty Transit	15.6	18	29
Heavy-Duty Transit	14.6	18	43
Ferry/Boat	21.2	N/A	13
Train/Streetcar	47.8	N/A	5
Snow Coach	47	N/A	12
School Bus	7	18	2

¹⁹ The GLAC 33 Red Bus Tours vehicles were excluded from this category, as they are approximately 80 years old.



Projected Recapitalization Costs

Using vehicle ages reported by NPS transit systems²⁰ and standard replacement costs and service life assumptions shown in Appendix G,²¹ it is estimated that the overdue vehicle recapitalization costs for NPS-owned shuttle/bus/van/tram rolling stock is \$2.0 million (see Table 7). Each park unit is responsible for determining when a vehicle needs to be replaced, which also depends on funding availability. Service life is highly dependent upon utilization, not only vehicle age; therefore, more detailed information is needed before determining if a vehicle is truly due for replacement.

Table 7: Estimated NPS-owned shuttle/bus/tram/van overdue recapitalization needs, up to 2016
(N = 217 vehicles)

Source: 2016 NPS National Transit Inventory data

Year	Overdue Recapitalization	Number of Vehicles Requiring Replacement (by Type)				Units
		Light-Duty Shuttle	Heavy-Duty Shuttle	Heavy-Duty Transit	6-12 Pax Electric Tram	
Up to 2016	\$2,093,000	2	5	7	3	CACO, GRCA, YELL

Assuming the majority of NPS-owned shuttle/bus/tram/van vehicles are recapitalized in-kind at the end of its expected service life, the agency faces an estimated \$43.8 million in rolling stock capital costs between 2017 and 2027.²² The projected costs are calculated in nominal dollars and may vary from year to year as vehicles from different systems are due to be replaced. Over the next five years (2017-2021), major recapitalization needs are projected at GLAC, HAFE, and ZION (see Table 8).

²⁰ NPS contributes funding to the ACAD vehicle fleet as part of an agreement with the State of Maine, which owns the fleet. The anticipated NPS capital contribution for this system is included in the recapitalization estimate.

²¹ The service life assumptions used to estimate the recapitalization needs and costs were updated in 2015 to reflect more current cost estimates for the transit vehicles, and to reflect the way NPS transit vehicles are utilized.

²² This year, the recapitalization analysis was validated using programmed projects identified at ACAD, ADAM, CACO, GLAC, and HAFE to increase the accuracy of the recapitalization estimate.



Table 8: Estimated NPS-owned shuttle/bus/tram/van rolling stock capital needs, 2017-2027

(N = 217 vehicles)

Source: 2016 NPS National Transit Inventory data

Year	Estimated Capital Replacement Costs	Estimated Number of Vehicles Requiring Replacement (by Type)							Units (Bold and Italics for units requiring > \$1 million) ²³	
		Passenger Van	Light-Duty Shuttle	Medium-Duty Shuttle	Heavy-Duty Shuttle	Medium-Duty Transit	Heavy-Duty Transit	School Bus		Electric Tram
2017	\$1,872,000		2				12		3	ACAD, PINN, GLAC, CACO
2018	\$9,524,352	2	3	2		27	13			ACAD, ZION , GLAC, HAFE
2019	\$2,172,000	2	1		4		15			ACAD, GLAC, GRCA, ORPI, ADAM
2020	\$1,453,000	1				1	4		1	ACAD, ADAM, SHEN, ZION, CARL
2021	\$4,438,000	1	13	2			6		1	CUIS, GLAC , HAFE , ZION
2022	\$1,249,000			1	8				2	HOF/ELROV/AMA, PINN, YELL
2023	\$15,894,000	2	7	1	26		18			CUIS, GLAC , GRCA , JOFL/ALPO, SHEN, YOSE , EUON
2024	\$2,633,000		4	13	2					GLAC, NOCA/LACH, ZION
2025	\$842,000		1	5						EUON, MEVE, SCBL, CUIS
2026	\$3,448,000		2	4	10					CACO, GRCA, KEMO, YOSE , CUIS
2027	\$286,000							2		TAPR
Grand Total	\$43,811,352									

²³ In order to estimate a service-wide transit vehicle replacement cost, replacement years and costs for individual systems are estimated using service-wide assumptions. Year of replacement for individual transit systems is an estimate only and should not be used in place of better information and judgment of park staff making transit system-specific decisions.



Next Steps

Wrapping up its fifth year, the inventory continues to provide essential information on NPS transit systems, including information on the number and types of transit systems operating in parks, yearly operating characteristics, and performance measures. This effort allows NPS stakeholders to understand the size of the NPS transit systems, in terms of the number of boardings and vehicles, and also the various business models that these system operate under. Park staff can use this information to identify systems of similar scales when undertaking vehicle replacement studies or other analyses to determine the best business model to operate their system.

The transit inventory is unique in that it collects yearly operational data, while other data initiatives focus on fixed NPS assets. The yearly effort ensures that information and data can be gathered efficiently, and provides for continuity through changes in staffing at the park level. As overall visitation at NPS parks continues to increase, transit systems continue to be important assets to reduce impacts to resources from personal vehicle use, while also enhancing the visitor experience.

The following lessons will be incorporated to improve future transit data calls:

- **Coordinate with relevant NPS stakeholders:** The NPS ATP should continue to coordinate with NPS stakeholders to share data and identify ways the transit data can be used to support various programs across the NPS.
- **Create new and/or refine existing data elements.** The NPS ATP should continue to refine the number of fields in the data call, adding or removing data fields as necessary, to gather needed information while limiting the burden of data collection on the park staff.
- **Improve the data collection online tool.** While the website was an improvement from previous years, the online data collection tool needs additional improvements to make it more user-friendly for park staff, and for the analysis of the transit data.
- **Emission analysis coordination.** The NPS ATP should consider coordinating with the Sustainable Operations and Climate Change (SOCC Branch) to understand ways in which the emissions reporting will be most useful, including looking into effective ways to communicate the emissions savings of NPS transit systems to visitors.
- **Continue to refine service life and replacement costs analysis.** Although the service life and replacement analysis was improved in 2015, there are still opportunities to further refine the assumptions used for this analysis. The majority of the current methodology assumes that vehicles are replaced in-kind with the same type of vehicle that is being replaced, and this may need to be reassessed as more fleets consider purchasing electric or alternative fuel vehicles.
- **Continue to expand performance measures analysis:** The NPS ATP is moving towards quantifying additional performance measures to track progress over time of NPS transit systems, and additional performance measures will continue to be considered as part of this report.
- **Revisit Transit Definition** (see page Appendix C) to reflect new laws and regulations.



Appendix

Appendix A – Acknowledgments

The NPS ATP would like to thank the numerous NPS transit system contacts who graciously provided their time, knowledge, and guidance in the development of this inventory.

Washington Support Office

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Coral Conway
Isle Royale National Park

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Cuyahoga Valley National Park

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Chuck Remus
Voyageurs National Park



Chris E. Smith
Apostle Islands National Lakeshore

National Capital Region

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National Capital Region

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National Mall & Memorial Parks

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Northeast Region

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Christine Bruins
Lowell National Historical Park

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Steamtown National Historic Site

Dierdre Gibson
Valley Forge National Historical Park

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Cape Cod National Seashore

John Joyce
Eisenhower National Historic Site

Caroline Keinath
Adams National Historical Park

John Kelly
Acadia National Park

John Mahoney
Fire Island National Seashore

Giles Parker
Boston Harbor Islands National Recreation Area

Scott Rector
Home of Franklin D. Roosevelt, Eleanor Roosevelt, and
Vanderbilt Mansion National Historic Sites

Tim Taglauer
Shenandoah National Park

Pacific West Region

Dianne Croal
Pacific West Region

Justin DeSantis
Pacific West Region

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Golden Gate National Recreation Area and
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Patricia Brown
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Southeast Region

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Steve Kovar
Mammoth Cave National Park

Dawn Leonard
Blue Ridge Parkway

Anthony Paladino
Fort Sumter National Monument

Sarah Perschall
Carl Sandburg Home National Historic Site

Lindsey Phillips
Gulf Islands National Seashore

Andrew Rich
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National Monuments

Mark Rich
Mammoth Cave National Park

Julia Treu-Fowler
San Juan National Historic Site

Nancy Walther
Kennesaw Mountain National Battlefield Park



Appendix B – NPS Alternative Transportation Program (ATP) Goals and Objectives

GOAL: Cultivate improvements in transportation connectivity, convenience, and safety for visitors and workforce.

OUTCOME: Access to, from, and within national park units is convenient, safe, and well-connected via appropriate and integrated transportation solutions.

- Develop transportation options that meet the diverse needs of park visitors and NPS workforce.
- Connect and enhance existing transportation options. (Undecided as to whether this one should remain – as it might inhibit creative solutions that can replace existing that do not function or cost too much money)
- Minimize injuries, fatalities, and crashes associated with all modes of transportation.
- Participate in local, regional, and statewide transportation planning processes to ensure appropriate integration of NPS transportation infrastructure, systems, and services.

GOAL: Provide quality transportation experiences that enhance park visits.

OUTCOME: NPS transportation systems contribute to the positive experience of park visitors.

- Improve visitor access to appropriate destinations.
- Use transportation to educate and inform visitors about park resources and services.
- Reduce disruptions to the visitor experience related to vehicle traffic congestion.
- Design and adapt transportation systems to complement each park's unique context and mission.

GOAL: Demonstrate leadership in environmentally-responsible transportation.

OUTCOME: NPS is recognized as a leader in environmentally-responsible transportation.

- Prioritize investments and operations that reduce vehicle emissions, noise and light pollution, traffic congestion, and unendorsed parking.
- Educate park visitors and workforce about the environmental benefits of transportation options within and beyond park boundaries.
- Contribute to NPS and park unit greenhouse gas emissions reduction goals.
- Implement proven green transportation innovations and best practices where appropriate.

GOAL: Ensure the long-term financial viability of NPS transportation infrastructure, systems, and services.

OUTCOME: Funding is adequate to maintain transportation infrastructure, operate transportation systems, and manage transportation services now and into the foreseeable future

- Consider the full range of business models and associated lifecycle costs (direct and indirect) before making investments.
- Increase the flexibility of funding mechanisms to better support transportation options.
- Right-size and maintain needed transportation assets and services in a state of good repair.



- Develop transportation options with reciprocal benefits for NPS and gateway communities which can be collaboratively funded and/or operated.
- Seek to enhance or develop partnerships with public, private, and philanthropic organizations that are aligned with the NPS mission.

GOAL: Manage the transportation program based on meaningful, reliable data.

OUTCOME: NPS demonstrates accountability in the management of transportation resources.

- Use measurable, applicable, and achievable performance measures and metrics to guide and support decision-making and management of the transportation program.
- Invest in and maintain data that supports performance measures aligned with program goals.
- Continually evaluate transportation options to ensure they meet program goals, and adjust operations to optimize system performance.



Appendix C – Definition of Transit

The NPS ATP developed a definition for an “NPS transit system” prior to conducting the 2012 transit inventory. Only units with systems that met each of these three criteria were considered for the inventory:

1. Moves people by motorized vehicle on a regularly scheduled service;²⁴
2. Operates under one of the following business models: concessions contract; service contract; partner agreement including memorandum of understanding, memorandum of agreement, or cooperative agreement (commercial use agreements are not included); or NPS-owned and operated; and²⁵
3. All routes and services at a given unit that are operated under the same business model by the same operator are considered a single NPS transit system.

This definition was based on a review of past efforts, analysis of the existing transit portfolio, and individual and group conversations with the Regional Transportation Program coordinators and the Federal Lands Highway Program Service-wide Maintenance Advisory Committee. In response to challenges encountered during the course of the inventory, made small changes to the original draft definition to improve clarity. The definition was uniformly applied to all potential systems to determine whether or not each should be included in the inventory.

The NPS ATP investigated several potential criteria that stemmed from existing ATP documents, Transit in Parks Program (TRIP) documents and applications, and conversations with ATP stakeholders, as presented below.

Provides transit service: An “NPS transit system” should provide transit service. In the glossary of the National Transit Database, the Federal Transit Administration defines transit as synonymous with public transportation and public transportation is defined as follows in the Federal Transit Act, “transportation by a conveyance that provides regular and continuing general or special transportation to the public, but does not include school bus, charter, or intercity bus transportation or intercity passenger rail transportation provided by [Amtrak].” Conversations with NPS regional transportation coordinators further specified transit service should be limited to motorized conveyances. Based on this, the NPS ATP proposed the following criterion: *“moves people by motorized vehicle on a regularly scheduled service.”*

Is important to the NPS mission: The importance of transit systems to fulfilling the NPS mission is a core tenet of the ATP, as established in previous program plans and extensively discussed at program meetings. However, the simple question “Is this system important to the NPS mission?” is subjective and would return inconsistent results. For many systems, particularly those for which the NPS has a financial stake or has a formal contract or agreement in place, the answer seems clear: because the NPS has made an effort to provide the service, the service is assumed to be important to the mission. Other services, particularly those which are operated under commercial use agreement (CUA), are not as clearly essential to the mission. Thus, the NPS ATP proposed the following criterion: *“operates under one of the following business models: concessions contract;*

²⁴ Services with a posted schedule that have standard operating seasons/days of week/hours. Services which do not operate on a fixed route, are charter services for individual groups, or exist for the sole purpose of providing access to persons with disabilities, are not included.

²⁵ For the purposes of this inventory, no distinction was drawn between memorandum of understanding, memorandum of agreement, and cooperative agreement. All were recorded as “cooperative agreement.”



service contract; partner agreement including memorandum of understanding, memorandum of agreement, or cooperative agreement (commercial use agreements are not included); or NPS owned and operated systems.” The NPS ATP used “cooperative agreement” as a general term, encompassing all qualifying partner agreements (memorandum of understanding, memorandum of agreement, and cooperative agreement).

Concession contracts were included because they require resources and desire by the NPS to initiate. Also, after the bid and award process, concession contracts limit competition with other private operators and thus generally result in close working relationships with the NPS. Commercial use agreements are not included because prospective CUA operators request permission from NPS to operate. These agreements are not initiated by the NPS and the resulting services are inherently not “NPS” systems.

CUAs were not included because these services are owned and operated by private operators, and the NPS only provides oversight to ensure that the services are operated in accordance with NPS policies and requirements. There are hundreds of CUAs service-wide that provide visitors tours and transportation. Collecting and reporting information on all of these systems could be burdensome to units and regions. If information were to be collected and reported on CUA services at all, an objective measure of importance would need to be identified and two key questions would need to be addressed. First, how does one objectively determine whether a service operated under a CUA is important versus non-essential to the NPS mission? This effort found only one sub-category of CUA that could be considered objective: services that provide sole access to an NPS resource. Second, should NPS represent as its own services for which it has no role in the acquisition, operations, or maintenance activities? Even for CUAs which provide sole access, this effort suggests not. This determination is not to suggest that the service is not important to the NPS, but rather to acknowledge that the service is not the responsibility of NPS – in other words, it is not an “NPS transit system.” These systems could be tracked separately but would not be included in the inventory.

Reduces Vehicle Miles Traveled (VMT): Reduced VMT was a key factor in TRIP applications because, in theory, reducing VMT reduces emissions. However, the simple question of “Does a system reduce VMT?” was tested on candidate NPS transit systems, and answers tended to be complex and debatable. The NPS ATP determined that “reduces VMT” is not an objective criterion. Although reducing VMT can be a goal of NPS transit systems, it should not be a defining characteristic.

Provides critical access: Both TRIP and Category III have traditionally funded systems which provide sole access via alternative transportation. The question “Does a system provide critical access?” was tested on candidate NPS transit systems. However, not all NPS transit systems provide critical access, and not all systems which provide critical access meet other likely criteria of a definition, such as NPS having a financial stake. Thus, this would not contribute toward a simple, clear definition.

Tours versus transportation: The TRIP program made a distinction between interpretive tours and transportation, the former being a recreational activity itself, and the latter being the conveyance of a passenger to or between activities. Whether a system is a tour or provides transportation was tested on candidate NPS transit systems. The distinction was often ambiguous. Many “transportation services” also provide interpretation or offer an experience on board. Many “tours” transport people to activities, allow people to get on and off, and/or take passengers to places in national parks that they could not access in their cars (for example, to a point on a body of water). Furthermore, both tours and transportation services further the visitor experience component of the NPS mission, and the NPS ATP sought not to prioritize one over the other. Although in daily life a transportation trip (often thought to be mandatory, for instance, to the



grocery store) might be more important than a tour trip (often thought to be discretionary, for instance, a historical tour of a battlefield), in a recreational setting such as national park both types of trips may be vital to providing high quality visitor experiences.

Is part of a connected, multimodal network: Several stakeholders suggested this criterion. However, it is vague, and requires further definition of the term “connected, multimodal network.”

Identifying unique systems: In order to be consistent service-wide in counting the number of transit systems, the NPS ATP investigated methods for defining where one transit system stops and another starts and tested these with candidate NPS transit systems, particularly at units thought to have more than one system. Based on this, the NPS ATP proposed a final criterion: *“all routes and services operated by the same operator under the same business model at a given unit are considered a single transit system.”*

Once developed, the pilot definition was shared individually with the Transportation Program Coordinators from each of the seven NPS regions. Feedback from each region was generally supportive. The definition was also presented at the May 2012 Federal Lands Highway Program Service-wide Maintenance Committee. Again, reaction by meeting participants was generally supportive. The Associate Director, Park Planning, Facilities, and Lands, formalized the draft definition in August 2012 in a memo titled: “National Park Service Transit Inventory Definition and Next Steps.



Appendix D – 2016 NPS National Inventory System List

Alaska Region (AKR)

Park Code	System Name	Vehicle Type	2016 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
DENA	Bus Tours and Shuttle Service	Shuttle/Bus /Van/Tram	371,130	NPS/Non-NPS	Concession Contract	Critical Access	Jim LeBel
GLBA	Day boat tour	Boat/Ferry	6,648	Non-NPS	Concession Contract	Interpretive Tour	Melanie Berg
GLBA	Airport Shuttle	Shuttle/Bus /Van/Tram	6,020	Non-NPS	Concession Contract	Transportation Feature	Melanie Berg
KATM	KATM bus tours	Shuttle/Bus /Van/Tram	1,391	Non-NPS	Concession Contract	Interpretive Tour	Robert Maupin

Intermountain Region (IMR)

Park Code	System Name	Vehicle Type	2016 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
BRCA	Bryce Canyon Shuttle and Rainbow Point Shuttle	Shuttle/Bus /Van/Tram	627,246	Non-NPS	Service Contract	Mobility to or Within Park	Daniel Cloud
DINO	Tram transit	Shuttle/Bus /Van/Tram	190,888	Non-NPS	Service Contract	Critical Access	Dan Johnson
GLAC	Sprinter Shuttles & Optima Shuttles	Shuttle/Bus /Van/Tram	207,564	NPS	Cooperative Agreement	Mobility to or Within Park	Stephen N. Smith
GLAC	Glacier Park Boat Company -interpretive boat tours	Boat/Ferry	81,049	Non-NPS	Concession Contract	Interpretive Tour	Jean Tabbert
GLAC	Red Bus Tours	Shuttle/Bus /Van/Tram	52,899	NPS	Concession Contract	Interpretive Tour	Jean Tabbert
GLAC	Hiker Shuttle	Shuttle/Bus /Van/Tram	9,161	Non-NPS	Concession Contract	Mobility to or Within Park	Jean Tabbert
GLAC	Sun Tours	Shuttle/Bus /Van/Tram	4,390	Non-NPS	Concession Contract	Interpretive Tour	Jean Tabbert
GLCA	Boat tours	Boat/Ferry	108,100	Non-NPS	Concession Contract	Interpretive Tour	Kelly Kager
GLCA	Flatwater tour	Boat/Ferry	57,171	Non-NPS	Concession Contract	Interpretive Tour	Kelly Kager
GLCA	Antelope Point	Boat/Ferry	43,747	Non-NPS	Concession Contract	Interpretive Tour	Kelly Kager
GLCA	SR276 passenger ferry	Boat/Ferry	3,610	Non-NPS	Service Contract	Transportation Feature	Kelly Kager
GRCA	South Rim Shuttle Service	Shuttle/Bus /Van/Tram	7,358,095	NPS	Service Contract	Mobility to or Within Park	Pamela Edwards



Park Code	System Name	Vehicle Type	2016 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
GRCA	Grand Canyon Railway	Other	352,100	Non-NPS	Concession Contract	Mobility to or Within Park	Pamela Edwards
GRCA	South Rim Bus Tours	Shuttle/Bus /Van/Tram	101,937	Non-NPS	Concession Contract	Interpretive Tour	Pamela Edwards
GRCA	North Rim Hiker Shuttle	Shuttle/Bus /Van/Tram	1,050	Non-NPS	Concession Contract	Mobility to or Within Park	Pamela Edwards
GRTE	Jenny Lake Shuttle Boat	Boat/Ferry	142,950	Non-NPS	Concession Contract	Mobility to or Within Park	Katy Canetta
LIBI	LIBI bus tours	Shuttle/Bus /Van/Tram	11,655	Non-NPS	Concession Contract	Interpretive Tour	Ken Woody
MEVE	Long House Trailhead tram and Half-day ranger guided	Shuttle/Bus /Van/Tram	10,546	Non-NPS	Concession Contract	Interpretive Tour	Allan Loy
ORPI	Ajo Mountain Drive tour	Shuttle/Bus /Van/Tram	2,031	NPS	NPS Owned and Operated	Critical Access	Cynthia Sequanna
ROMO	Bear Lake & Moraine Park shuttle, Hiker Shuttle to Estes Park	Shuttle/Bus /Van/Tram	705,766	Non-NPS	Service Contract	Critical Access	John Hannon
YELL	YELL boat	Boat/Ferry	20,451	Non-NPS	Concession Contract	Interpretive Tour	Dale Reinhart
YELL	Xanterra Parks & Resorts interpretive bus tours	Shuttle/Bus /Van/Tram	19,178	NPS/Non-NPS	Concession Contract	Interpretive Tour	Christina Mills
YELL	Historic Yellow Bus tours	Shuttle/Bus /Van/Tram	12,017	NPS	Concession Contract	Interpretive Tour	Dale Reinhart
YELL	Xanterra Parks & Resorts interpretive snowcoaches tours	Shuttle/Bus /Van/Tram	9,296	Non-NPS	Concession Contract	Interpretive Tour	Christina Mills
YELL	YELL snow coaches	Snowcoach	3,116	NPS/Non-NPS	Concession Contract	Interpretive Tour	Christina Mills
ZION	Zion Canyon Shuttle	Shuttle/Bus /Van/Tram	5,993,148	NPS	Service Contract	Critical Access	Jack Burns



Midwest Region (MWR)

Park Code	System Name	Vehicle Type	2016 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
APIS	Excursion Boat	Boat/Ferry	42,345	Non-NPS	Concession Contract	Interpretive Tour	Chris E. Smith
CUVA	Cuyahoga Valley Scenic Railroad	Other	214,063	Non-NPS	Cooperative Agreement	Mobility to or Within Park	Jennifer McMahon
ISRO	MV Isle Royal Queen IV	Boat/Ferry	12,956	Non-NPS	Concession Contract	Critical Access	Coral Conway
ISRO	MV Voyageur II and Sea Hunter III	Boat/Ferry	9,346	NPS/Non-NPS	Concession Contract	Critical Access	Coral Conway
ISRO	MV Ranger III	Boat/Ferry	5,055	NPS	NPS Owned and Operated	Critical Access	Coral Conway
ISRO	MV Sandy tour	Boat/Ferry	4,848	Non-NPS	Concession Contract	Interpretive Tour	Coral Conway
ISRO	Royale Air Service Inc. float plane	Plane	2,710	Non-NPS	Concession Contract	Critical Access	Coral Conway
PIRO	Pictured Rocks Cruises	Boat/Ferry	157,921	Non-NPS	Concession Contract	Interpretive Tour	John Patmore
SCBL	SCBL free shuttle service	Shuttle/Bus /Van/Tram	2,732	NPS	NPS Owned and Operated	Mobility to or Within Park	Justin Cawiezel
SLBE	Manitou Island Transit	Boat/Ferry	11,629	Non-NPS	Concession Contract	Transportation Feature	Phil Akers
TAPR	TAPR bus tour	Shuttle/Bus /Van/Tram	2,459	NPS	NPS Owned and Operated	Interpretive Tour	Heather Brown
VOYA	VOYA tour boat	Boat/Ferry	2,607	NPS	NPS Owned and Operated	Interpretive Tour	Chuck Remus

National Capital Region (NCR)

Park Code	System Name	Vehicle Type	2016 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
HAFE	HAFE shuttle transport	Shuttle/Bus /Van/Tram	440,060	NPS	Service Contract	Critical Access	Dennis Ebersole
NAMA	Big Bus Tours Washington DC	Shuttle/Bus /Van/Tram	1,062,045	Non-NPS	Concession Contract	Interpretive Tour	Karl Gallo
NAMA	DC Circulator	Shuttle/Bus /Van/Tram	493,639	Non-NPS	Cooperative Agreement	Transportation Feature	Eliza Voigt
WOTR	Fairfax Connectors Wolf Trap Express	Shuttle/Bus /Van/Tram	6,370	Non-NPS	Service Contract	Mobility to or Within Park	Duane Erwin



Northeast Region (NER)

Park Code	System Name	Vehicle Type	2016 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
ACAD	Island Explorer & Bicycle Express	Shuttle/Bus /Van/Tram	575,397	Non-NPS	Cooperative Agreement	Mobility to or Within Park	John Kelly
ADAM	Adams trolley	Shuttle/Bus /Van/Tram	65,307	NPS	Service Contract	Critical Access	Caroline Keinath
BOHA	Thompson Island Ferry	Boat/Ferry	23,188	Non-NPS	Cooperative Agreement	Mobility to or Within Park	Giles Parker
BOHA	Boston Light Tour	Boat/Ferry	4,130	Non-NPS	Cooperative Agreement	Interpretive Tour	Giles Parker
CACO	Coastguard Beach Shuttle	Shuttle/Bus /Van/Tram	93,848	NPS	NPS Owned and Operated	Critical Access	Karst Hoogeboom
EISE	EISE shuttle	Shuttle/Bus /Van/Tram	99,588	Non-NPS	Concession Contract	Critical Access	John Joyce
FIIS	Sailors Haven Ferry	Boat/Ferry	42,276	Non-NPS	Concession Contract	Critical Access	John Mahoney
FIIS	Watch Hill Ferry	Boat/Ferry	23,718	Non-NPS	Concession Contract	Critical Access	John Mahoney
HOFR/ ELRO/ VAMA	Roosevelt Ride	Shuttle/Bus /Van/Tram	24,654	NPS	NPS Owned and Operated	Mobility to or Within Park	Scott Rector
HOFR/ ELRO/ VAMA	FDR Tram	Shuttle/Bus /Van/Tram	24,438	NPS	NPS Owned and Operated	Special Needs	Scott Rector
HOFR/ ELRO/ VAMA	Val-Kill Tram	Shuttle/Bus /Van/Tram	16,073	NPS	NPS Owned and Operated	Special Needs	Scott Rector
JOFL/ ALPO	Lakebed Tours	Shuttle/Bus /Van/Tram	1,107	NPS	NPS Owned and Operated	Interpretive Tour	Doug Bosley
LOWE	LOWE Historic Trolley	Train/ Trolley	56,942	NPS	NPS Owned and Operated	Mobility to or Within Park	Christine Bruins
LOWE	Canal Tours	Boat/Ferry	14,812	NPS	NPS Owned and Operated	Interpretive Tour	Christine Bruins
SHEN	Rapidan Camp bus	Shuttle/Bus /Van/Tram	1,324	NPS	NPS Owned and Operated	Interpretive Tour	Tim Taglauer
STEA	Scranton Limited & Live Steam Excursions	Train/ Trolley	25,103	NPS	NPS Owned and Operated	Interpretive Tour	Deborah Conway
STLI/ ELIS	Statue of Liberty Ferries	Boat/Ferry	10,951,032	Non-NPS	Concession Contract	Critical Access	Ben Hanslin
VAFO	History of Valley Forge Trolley Tour	Shuttle/Bus /Van/Tram	11,331	Non-NPS	Cooperative Agreement	Interpretive Tour	Deirdre Gibson



Pacific West Region (PWR)

Park Code	System Name	Vehicle Type	2016 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
CHIS	Island Packers	Boat/Ferry	134,444	Non-NPS	Concession Contract	Critical Access	Travis Poulson
CRLA	Crater Lake Boat Tour	Boat/Ferry	17,758	Non-NPS	Concession Contract	Interpretive Tour	Sean Denniston
CRLA	Rim Drive Trolley Tour	Shuttle/Bus /Van/Tram	9,656	Non-NPS	Concession Contract	Interpretive Tour	Sean Denniston
DEPO	Reds Meadow Shuttle Bus	Shuttle/Bus /Van/Tram	190,148	Non-NPS	Cooperative Agreement	Critical Access	Deanna Dulen
EUON	NPS Shuttle	Shuttle/Bus /Van/Tram	4,642	NPS	NPS Owned and Operated	Critical Access	Tom Leatherman
GOGA/ ALCA	Alcatraz Cruises ferry	Boat/Ferry	2,811,578	Non-NPS	Concession Contract	Critical Access	Maria Banuelos Connell
MUWO	Muir Woods Shuttle	Shuttle/Bus /Van/Tram	124,043	Non-NPS	Cooperative Agreement	Mobility to or Within Park	Darren Brown
NOCA/ LACH	Rainbow Falls Tours	Shuttle/Bus /Van/Tram	17,502	NPS	Concession Contract	Interpretive Tour	Annelise Lesmeister
NOCA/ ROLA	Ross Lake Hiker Shuttle	Boat/Ferry	351	Non-NPS	Concession Contract	Transportation Feature	Annelise Lesmeister
PINN	Pinnacle Shuttle	Shuttle/Bus /Van/Tram	44,984	NPS	NPS Owned and Operated	Mobility to or Within Park	Debbie Simmons
PORE	Headlands Shuttle	Shuttle/Bus /Van/Tram	19,394	Non-NPS	Service Contract	Critical Access	John A. Dell'Osso
SEKI	Giant Forest Shuttle	Shuttle/Bus /Van/Tram	735,453	Non-NPS	Cooperative Agreement	Critical Access	Colleen Bathe
SEKI	Gateway Shuttle	Shuttle/Bus /Van/Tram	11,348	Non-NPS	Cooperative Agreement	Mobility to or Within Park	Colleen Bathe
VALR	USS Arizona Memorial Tour	Boat/Ferry	2,573,392	Non-NPS	Cooperative Agreement	Critical Access	Daniel Brown
VALR	Ford Island Tour	Shuttle/Bus /Van/Tram	531,668	Non-NPS	Service Contract	Interpretive Tour	Daniel Brown
YOSE	Yosemite Valley Shuttle	Shuttle/Bus /Van/Tram	3,728,374	NPS	Concession Contract	Mobility to or Within Park	Jim Donovan
YOSE	Badger Pass-Glacier Point shuttle	Shuttle/Bus /Van/Tram	126,104	NPS	Concession Contract	Mobility to or Within Park	Jim Donovan
YOSE	Tram Tours and Hiker Shuttle	Shuttle/Bus /Van/Tram	121,079	Non-NPS	Concession Contract	Interpretive Tour	Jim Donovan
YOSE	YARTS	Shuttle/Bus /Van/Tram	114,452	Non-NPS	Cooperative Agreement	Mobility to or Within Park	Jim Donovan
YOSE	Winter Ski Shuttle	Shuttle/Bus /Van/Tram	8,936	Non-NPS	Concession Contract	Mobility to or Within Park	Jim Donovan
YOSE	Tuolumne Shuttle	Shuttle/Bus /Van/Tram	7,890	NPS	Concession Contract	Mobility to or Within Park	Jim Donovan



Southeast Region (SER)

Park Code	System Name	Vehicle Type	2016 Passenger Boardings	Vehicle Ownership	Agreement Type	Purpose	NPS Contact Name
BLRI	Sharp Top Mountain Shuttle	Shuttle/Bus /Van/Tram	5,671	Non-NPS	Concession Contract	Interpretive Tour	Dawn Leonard
CALO	Ferry service	Boat/Ferry	95,857	Non-NPS	Concession Contract	Critical Access	Mike Baker
CARL	Electric Shuttle	Shuttle/Bus /Van/Tram	2,883	NPS	NPS Owned and Operated	Special Needs	Sarah Perschall
CUIS	Ferry service	Boat/Ferry	47,032	Non-NPS	Concession Contract	Critical Access	Jill Hamilton-Anderson
CUIS	Land and Legacies Tour	Shuttle/Bus /Van/Tram	4,287	NPS	Concession Contract	Interpretive Tour	Jill Hamilton-Anderson
DRTO	Ferry service	Boat/Ferry	54,951	Non-NPS	Concession Contract	Critical Access	William Gordon
DRTO	Key West Seaplane Adventures	Plane	13,689	Non-NPS	Concession Contract	Interpretive Tour	William Gordon
EVER	Shark Valley Tram Tour	Shuttle/Bus /Van/Tram	74,655	Non-NPS	Concession Contract	Interpretive Tour	William Gordon
FOMA/CASA	Ferry service	Boat/Ferry	127,366	NPS	NPS Owned and Operated	Critical Access	Andrew Rich
FOSU	Ferry service	Boat/Ferry	335,370	Non-NPS	Concession Contract	Critical Access	Anthony Paladino
GUIS	Ship Island Ferry	Boat/Ferry	54,316	NPS/Non-NPS	Concession Contract	Transportation Feature	Lindsey Phillips
KEMO	Shuttle Bus	Shuttle/Bus /Van/Tram	10,210	NPS	Service Contract	Critical Access	Nancy Walther
MACA	Cave Tours Bus Shuttle	Shuttle/Bus /Van/Tram	231,479	NPS/Non-NPS	Concession Contract	Transportation Feature	Mark Rich
MACA	Green River and Houchin Ferries	Boat/Ferry	163,259	NPS	NPS Owned and Operated	Transportation Feature	Steve Kovar
SAJU	San Juan Trolley	Shuttle/Bus /Van/Tram	Not reported.	NPS	Cooperative Agreement	Mobility to or Within Park	Julia Treu-Fowler



Appendix E – Systems Removed from 2016 Inventory

As discussed in the introduction of this report, select transit systems present in the 2015 inventory were not included in this 2016 inventory. These systems were removed either because they are operated under a commercial use authorization (CUA), which does not fall under the definition of transit used for the inventory, or because they are chartered activities. Chartered service does not meet the inventory’s definition of transit. The full list of removed systems is provided in this Appendix, along with the reason each system was removed.

Region	Park	System	Comments
AKR	DENA	Airplanes owned by K2	Chartered
AKR	DENA	Airplanes owned by Sheldon	Chartered
AKR	DENA	Airplanes owned by Kantishna Air Taxi	CUA
AKR	DENA	Airplanes owned by Talkeetna Air Taxi	CUA
AKR	DENA	Airplanes owned by Fly Denali	Chartered
AKR	KATM	Float plane 1	Chartered
AKR	KATM	Float plane 2	Chartered
AKR	KATM	Float plane 3	Chartered
AKR	KATM	Float plane 4	Chartered
AKR	KATM	Float plane 5	Chartered
AKR	KATM	Float plane 6	Chartered
AKR	KATM	Float plane 7	Chartered
IMR	YELL	Buffalo Bus Touring (YELL 506,509,510) Summer	CUA
IMR	YELL	Gary Fales Outfitting Inc	CUA
IMR	YELL	See Yellowstone Alpen Guides (YELL 501,502)	CUA
IMR	YELL	Yellowstone Expeditions (YELL 300)	CUA
IMR	YELL	Backcountry Adventures (YELL 504)	CUA
IMR	YELL	Scenic Safaris (YELL 512,513,514,515,516,517,518)	CUA
IMR	YELL	Buffalo Bus Touring (YELL 506,509,510) Winter	CUA
NER	BOHA	BOHA Ferries	CUA
PWR	CHIS	Channel Islands Aviation	Chartered
SER	BUIS	Teroro II, Inc	Chartered



Region	Park	System	Comments
SER	BUIS	Big Beards Adventure Tours	Chartered
SER	BUIS	Jolly Roger Charters	Chartered
SER	BUIS	Caribbean Sea Adventures	Chartered
SER	BUIS	Llewellyns Charters	Chartered
SER	BUIS	Dragonfly	Chartered
SER	EVER	Gulf Coast and Flamingo Boat Tours	CUA



Appendix F – Estimated CO₂ Emissions Methodology

In order to calculate the estimated emissions avoided by NPS visitors using park transit systems instead of their personal vehicles, the estimated emissions avoided by private vehicles is subtracted from the emissions of NPS and non-NPS transit systems. Calculating emissions avoided by private vehicles requires estimating passenger miles travelled for park transit systems, a major limitation of which is described below. Negative emissions values represent emissions saved, or avoided.

A major assumption of this methodology is that each passenger boarding results in a trip that is equal to the average number of service miles per service run. For some systems, such as interpretive tours, this might indeed be the case. However, for a more complicated, transit-like system that involves multiple stops and hop-on, hop-off service, this alternative methodology could greatly overestimate the personal vehicle miles travelled avoided, thus overestimating the emissions avoided.

Fuel consumption by transit vehicles was calculated using the following constants:

Fuel Economy²⁶

Pre-2014 Vehicle Class	2014 Vehicle Class	MPG
12-pass., full-size van	None	14
15-pass., full-size van	Van	14
28-pass. bus	Light-duty Shuttle	5
Light-duty hybrid-elec. bus	Light-duty Shuttle Hybrid	8
30-pass., 20-40 ft., heavy-duty bus	Medium-duty Shuttle	5
Med. duty hybrid-elec. bus	Medium-duty Shuttle Hybrid	7
40-pass., 30 ft., heavy-duty bus	Heavy-duty Shuttle	4
Heavy-duty hybrid-elec. bus	Heavy-duty Shuttle Hybrid	6
CNG (compressed natural gas) heavy-duty transit bus	Heavy-duty Shuttle CNG	3
54-passenger school bus	54-passenger School Bus	7

CO₂ Emissions by Fuel Type²⁷

Fuel Type	Emissions (grams/gallon)
Propane	5,720
Gasoline (E10)	8,477
Natural Gas	4,460
Diesel	10,210
Biodiesel (B20)	10,058

The following methodology was used to complete the emissions analysis.

²⁶ Department of the Interior – Bus Lifecycle Cost Modeling. <http://www.volpe.dot.gov/transportation-planning/public-lands/department-interior-bus-and-ferry-lifecycle-cost-modeling>

²⁷ United States Environmental Protection Agency, Emission Factors for Greenhouse Gas Inventories, https://www.epa.gov/sites/production/files/2015-07/documents/emission-factors_2014.pdf



Calculate average transit trip length using the annual service miles and annual runs, then multiply by annual passenger boardings to estimate passenger miles travelled (PMT):

$$\left(\frac{\text{annual service miles}}{\text{annual runs}} \right) \times (\text{annual passenger boardings}) \cong \text{PMT}$$

Calculate number of personal vehicle miles travelled avoided:

$$\left(\frac{\text{PMT}}{\text{average visitors per vehicle}} \right) \cong \text{personal vehicle miles travelled avoided}$$

Calculate gallons of personal vehicle fuel saved:

$$\left(\frac{\text{personal vehicle miles travelled avoided}}{\text{average fuel economy for light duty passenger vehicles}} \right) \cong \text{gallons of personal vehicle fuel saved}$$

Calculate metric tons of CO₂ emissions from personal vehicles avoided²⁸:

$$\left(\frac{\text{gallons of personal vehicle fuel saved} \times \text{grams of CO}_2 \text{ per gallon}}{1,000,000 \text{ grams per metric ton}} \right) \cong \text{metric tons CO}_2 \text{ emissions from personal vehicles avoided}$$

Calculate metric tons of CO₂ emissions from transit system²⁹:

$$\left(\frac{\left(\frac{\text{annual service miles}}{\text{transit vehicle fuel economy}} \right) \times \text{grams of CO}_2 \text{ per gallon}}{1,000,000 \text{ grams per metric ton}} \right) = \text{metric tons CO}_2 \text{ emissions from transit system}$$

Subtract metric tons of personal vehicle CO₂ emissions from metric tons of transit system CO₂ emissions to calculate net metric tons of CO₂ emissions:

$$\begin{aligned} & (\text{metric tons CO}_2 \text{ emissions from transit system} \\ & \quad - \text{metric tons CO}_2 \text{ emissions from personal vehicles avoided}) \\ & = \text{net metric tons of CO}_2 \text{ emissions} \end{aligned}$$

Repeat for each system that provided the necessary data, then sum for total net emissions.

²⁸ Personal vehicles were assumed to use gasoline as a fuel type. The specific value for grams of CO₂ per gallon, along with source information, are found at the beginning of this appendix.

²⁹ Transit vehicle emissions were calculated on a per-vehicle basis depending on each vehicle's reported fuel type. Specific values for grams of CO₂ per gallon of fuel, along with source information, are found at the beginning of this appendix.



Appendix G – Vehicle Replacement Assumptions

Uniform vehicle replacement costs and expected service lives were used to provide service-wide consistency in estimates of vehicle age, remaining service life, and recapitalization costs. These assumptions were updated for the 2015 Inventory from, previous inventories³⁰, to reflect the usage and operating characteristics of NPS vehicles. NPS vehicles are not utilized in the same way that city transit vehicles are; they are typically not used for the entire year, nor are they used as intensively as transit vehicles in an urban environment. Vehicle cost estimates were mostly taken from the General Service Administration’s AutoChoice Database.

Assumptions	Gas/Diesel/Biodiesel/Propane		CNG	
	Replacement Cost	Expected Life	Replacement Cost	Expected Life
Passenger Van	\$33,000	10	N/A	N/A
Light-duty Shuttle	\$107,000	15	\$120,500	10
Medium-Duty Shuttle	\$147,000	15	\$154,000	10
Heavy-Duty Shuttle	\$147,000	15	\$158,000	10
Medium-Duty Transit	\$275,000	18	\$330,000	20
Heavy-Duty Transit	\$440,000	18	\$478,000	20
School Bus	\$126,500	18	N/A	N/A
6-12 pax Electric Tram	N/A	11	N/A	11

³⁰ The 2014 Inventory used Replacement costs and expected life assumptions based on the Federal Transit Administration: Useful Life of Transit Buses and Vans – April 2007 (http://www.fta.dot.gov/documents/Useful_Life_of_Buses_Final_Report_4-26-07_rv1.pdf).



Assumptions	Electric-Hybrid		Electric	
	Replacement Cost	Expected Life	Replacement Cost	Expected Life
Passenger Van	N/A	10	\$100,000	10
Light-duty Shuttle	\$136,000	15	\$395,000	15
Medium-Duty Shuttle	\$330,000	15	N/A	15
Heavy-Duty Shuttle	\$352,000	15	N/A	15
Medium-Duty Transit	\$495,000	18	\$500,000	18
Heavy-Duty Transit	\$605,000	18	\$750,000	18
School Bus	N/A	18	N/A	18
6-12 pax Electric Tram	\$20,000	11	N/A	11



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